THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · RAILWAY OFFICIAL GAZETTE

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (6 lines)

Annual subscription payable in advance and postage free:
British Isles and Abroad.....£2 5s. 0d.
Single Copies.....One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 66. No. 17 FRIDAY, APRIL 23, 1937

CONTENTS

	PAGE
Editorials	789
Letters to the Editor	794
Publications Received	795
The Scrap Heap	796
Overseas Railway Affairs	797
British Locomotive Types—X, L.N.E.R.	800
Reorganisation of the Motive Power Department on the L.M.S.R.	803
Resignalling Leeds new Station, L.N.E.R.	813
New 0-6-0 Locomotives, G.N.R.	817
Railway News Section	819
Personal	819

The Budget

ACCOUNTANTS and lawyers necessarily benefit by any change in National taxation, by reason of the additional calls on their professional services, and a new form of tax reacts in favour of the civil servant by requiring new or enlarged departmental staffs. The Budget introduced by Mr. Neville Chamberlain on Tuesday offers another benefit to the professional, for, like the war-time Excess Profits Duty, the new National Defence Contribution is a tax on industry and business but excludes the professions. The main features of the "ordinary" part of the Budget were generally as expected—a 3d. increase on income tax, bringing the standard rate up to 5s. in the £; and no changes in the duties of the motor-car horsepower tax, or petrol, tobacco, intoxicants, and so forth. Undoubtedly the outstanding surprise element was the National Defence Contribution, described as a temporary contribution, which is to be a graduated tax on the *growth* of profits by all engaged in industry or business where, in any accounting year ended after April 5, 1937, the profits exceed £2,000. In this connection the taxpayer is offered his choice of alternatives, as profits will be compared from year to year either with a percentage on capital (the "standard" being 6 per cent. for companies and 8 per cent. for firms, on the cost of the assets in the business, subject to suitable adjustments), or with the average profits of the three years, 1933, 1934, and 1935. Broadly, where the capital standard is adopted —as presumably will be the case with British railway companies—the tax on profits up to 6 per cent. will be nil; between 6 and 10 per cent. one fifth of the growth; between 10 and 15 per cent. one quarter; and above 15 per cent. one third. On the profits standard, amounts between £2,000 and £12,000 are subject to an abatement of one fifth of the amount by which the profits fall short of the larger sum.

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Railways and the Land

In an editorial in these columns last week we commented on the overcrowding difficulties that were facing the London Passenger Transport Board in the Hendon area, where in recent years there has been an extraordinary increase in population. Only so recently as 1924 the old "Underground" completed at a cost of a large capital outlay an extension of the Hampstead tube into what was then, so far as the builder was concerned, almost virgin country. For this enterprise the London Passenger Transport Board is now, paradoxically enough, being made a victim of severe criticism. Immediately the tube to Edgware was mooted the speculators began and have continued to reap huge profits from the development of the area served. The consequence has been that the board has been faced with traffic increases which the line cannot long continue to bear. At the meeting of the old Underground Group in 1927, Lord Ashfield, as Chairman, suggested that it might be desirable that there should be "some means by which the increment in the value of the land could be appropriated to pay some share of the enormous cost attending the construction of underground railways in Greater London." Had such provision been made when the line was being constructed, there would have been no financial difficulty in meeting the public needs today.

* * * *

The Week's Traffics

Latest returns of the four group companies are for a normal week and compare with those of a week in 1936 which included Easter Monday. Passenger train traffics are, in consequence, down in every case, but general merchandise and coal receipts are substantially up, and far exceed the passenger train decreases. To date the four companies together have earned £43,181,000, an increase of £1,284,000, or 3·06 per cent., on the figures for the corresponding period of 1936.

	15th Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R. ..	− 23,000	+122,000	+ 96,000	+195,000	+ 582,000	+ 3·41
L.N.E.R. ..	− 26,000	+ 64,000	+ 84,000	+122,000	+ 337,000	+ 2·67
G.W.R. ..	− 21,000	+ 60,000	+ 59,000	+ 98,000	+ 287,000	+ 4·14
S.R.	− 5,000	+ 9,000	+ 7,000	+ 11,000	+ 78,000	+ 1·48

Irish railway traffics compare with those for Easter Week in 1936, but the increases in goods traffics are less than the decreases on the passenger side. The Belfast & County Down, for instance, has a decrease of £1,431 in passengers, with an increase of £125 in goods. On the Great Northern the passenger decrease is £5,100 and the goods increase £1,750, and on the Great Southern there is a goods increase of £4,516 against a passenger decrease of £11,318. London Transport receipts for the past week were £575,700, an increase of £25,100.

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Mauritius Government Railways

The largest sugar crop ever produced in Mauritius caused an increase of Rs. 321,924 in the receipts of the Mauritius Government Railways during the financial year ended June 30, 1936. The length of line worked was 110½ miles of 4 ft. 8½ in. running lines besides sidings and also the 13⅓ miles of the 2 ft. 6 in. Bois Chéri Light Railway. On the Midland (Port Louis-Mahebourg) line of 35¼ miles there are 4¼ miles of double track. Passenger revenue fell off partly from shortage of money following the low price of sugar and partly from improvement in the quality

of buses. On the goods side receipts from sugar canes and sugar improved from Rs. 716,359 to Rs. 1,083,786.

	1935–36	1934–35
Passengers	2,972,736	3,200,118
Paying goods, tons	422,811	279,646
Train-miles	477,984	457,055
Operating ratio, per cent.	92·06	108·46
	Rs.	Rs.
Passenger receipts	466,307	510,728
Goods receipts	1,288,520	928,850
Total receipts	1,918,432	1,596,508
Total expenditure (excluding Rs. 300,000 for renewals)	1,766,151	1,731,516
Net receipts	152,281	Dr. 135,008

The transport of all Government goods is now undertaken by or through the agency of the Railway Department, either by rail or by road at fixed rates. The working of the Transport Control Board Ordinance has not yet stabilised passenger traffic as between rail and road.

* * * *

Overseas Railway Traffics

During the three weeks since the third quarter of the financial year, Argentine railway traffics have shown up well. In the course of the three weeks the additions made to previous increases have been £190,622 on the Central Argentine, £137,945 on the Buenos Ayres Great Southern, £64,918 on the Buenos Ayres & Pacific, £32,949 on the Buenos Ayres Western, and £30,680 on the Cordoba Central. At the end of the 42nd week of the previous financial year the Central Argentine was only £14,382 up on 1934-35, and the Great Southern was £562,527 down, although the Pacific showed an advance of £270,651. The accompanying table indicates the great improvement in the sterling traffic position in comparison with 1934-35.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
		£	£	£	£
Buenos Ayres & Pacific	42nd	124,318	+ 21,087	3,908,231	+ 393,503
Buenos Ayres Great Southern	42nd	171,092	+ 31,257	6,349,150	+ 823,789
Buenos Ayres Western	42nd	65,757	+ 13,348	2,071,976	+ 184,523
Central Argentine	42nd	171,402	+ 59,055	6,459,357	+ 1,427,995
Canadian Pacific	15th	542,800	+ 48,000	7,420,000	+ 565,400
Bombay, Baroda & Central India	2nd	272,625	— 6,675	272,625	— 6,675

Total receipts of the B.B. & C.I.R. for the 52 weeks of the financial year ended March 31 were £8,947,050, an increase of £516,900.

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Impressing the Young Idea

On Tuesday, April 13, 1,300 members of the Crusaders' Union were conveyed by the Southern Railway to Southampton, the principal object of the visit being a tour of the *Queen Mary*, an inspection of the floating dock, the King George V graving dock, and the docks generally. Of the boys, who were all drawn from public, public secondary, and private schools, 1,200 were conveyed from London, and the Southern Railway did not lose the opportunity of impressing the boys in the locomotive realm. Two trains, each a 14-coach formation of the latest open corridor stock, and each incorporating six kitchen cars, had been marshalled, so that every boy might be served where he sat with a hot lunch on the down journey, and tea on the return. For the first train, which made a non-stop run from Waterloo to the shed alongside the ship, *Lord Anson* of the "Lord Nelson" type had been provided, carrying on the smokebox the handsome Crusader badge which figures in the photograph on page 818 of this issue. Despite a gross load of fully 510 tons behind the tender, Basingstoke, 47·9 miles, was passed in 54 min. 30 sec., and Winchester 66·9 miles, in 73 min. 20 sec., notable features of the running being the minimum speed of 52 m.p.h. up the long rise past Brookwood, and the maximum of 79 below Micheldever; but for signal checks Southampton would have been reached more than 10 min. early. This was excellent propaganda for such a party, the travelling of many of whose members is confined to parental motorcars, and not a few derived more keen enjoyment from crawling over the *Lord Anson* than from the glories of the *Queen Mary!*

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The Paisley & Renfrew Centenary

The fact that the little 3½-mile Paisley & Renfrew Railway was opened on April 3, 1837, and so has now become a centenarian, was recorded in an editorial note in our issue of April 2. We then outlined in brief the history of the line, and simultaneously *The Glasgow Herald* also made various references to the early days of the enterprise. Having available its file of 100 years ago, our Scottish contemporary extracted some interesting particulars of a trial trip a few days before the public opening, when it was recorded that "two crowded carriages were taken in tow by the engine, and the trip down was made in 12 minutes. Coming up there were in all 84 passengers, and the time taken was 13 minutes." Of the original passenger accommodation, the same account states quaintly that "a very commodious shed has been erected at the upper end, where passengers can get in dry in any state of the weather, and a similar one is to be built at Renfrew wharf until a suitable house for passengers be provided." This line has been used frequently by members of the royal family when, during visits to Clydeside, they stayed at Blythswood House. When our present King and Queen, then Duke and Duchess of York, were last in residence at Blythswood House, in 1927, their train made a special halt to permit the royal travellers to alight at one of the private entrances to the estate, between Renfrew Fulbar Street station and the Wharf station.

* * * *

Job Analysis in India during 1935-36

In the course of our editorial last week entitled "Indian Railways in 1935-36," we mentioned that the continuation and extension of job analysis, inaugurated originally at the instance of the Pope Economy Committee, were effecting considerable economies on the larger railways during the period under review. These economies together with the cost of the organisation required to secure them were as follow:—

Railway	Cost of job analysis organisation	Savings effected	Net amount saved
	Rs.	Rs.	Rs.
East Indian	1,13,541	5,82,459	4,68,918
Great Indian Peninsula	53,574	2,04,859	1,51,285
North Western	56,729	7,22,202	6,65,473
Eastern Bengal	26,134	41,600	15,466
Bombay Baroda & C.I.	3,643	2,25,682	2,21,039
Madras & S. Mahratta	4,920	2,56,000	2,51,080
South Indian	221	8,463	8,242
Burma	—	77,591	77,591
Bengal-Nagpur	17,575	13,68,493	13,50,918
	2,76,337	34,87,349	31,60,012

In other words, for every rupee spent, twelve were saved on an average throughout India. It is significant, however, that the Burma Railways were able to save over three-quarters of a lakh of rupees without any special organisation, and that on the Bengal-Nagpur Railway the return upon outlay was nearly 80-fold.

* * * *

The Revolution in Railway Refreshment

The new type of hygienic platform buffet trolleys which can be seen gliding about on pneumatic tyred wheels at many railway stations, attract the eye not only by the display of gleaming glass and metal-work but by the appetising variety of food and drink they offer. They are

however but another example of the ways, " Meritorious and many " as Matthew Arnold would have said, in which the railway companies seek to cater for the inner man. The railways were not always so attentive in this respect towards the comfort of the traveller and there must be many alive today with vivid recollections of the " grab, gulp, and run " period of the heyday of the York, Normanton, and Preston refreshment rooms which perhaps anticipated modern mass methods by their introduction of wholesale indigestion. The average refreshment room of the sixties, however, left even more to be desired, and the doubtful quality of the fare provided led Charles Dickens to write " I cannot dine on stale sponge cakes that turn to sand in the mouth, I cannot dine on shining brown patties composed of unknown animals within and offering to my view the device of an indigestible star fish in leaden pie crust without. I cannot dine on a sandwich that has long been pining under an exhausted receiver. I cannot dine on Barley sugar. I cannot dine on Toffee." As to the attractions of the counter he declared " I must make myself sick or flaky with Banbury cake, or I must stuff into my delicate organisation a currant pin-cushion which I know will swell into immeasurable dimensions when it has got there."

* * * *

The World's Busiest Main Line

For records in track occupation over long-distance main lines the world would probably advance several claimants. Busiest of all, probably, is the electrified Pennsylvania between New York and Philadelphia, where the traffic to and from Baltimore, Washington and the south separates from that serving Pittsburgh, Chicago and the west; but this section of the Pennsylvania is barely one hundred miles in length. The L.M.S.R. over the 158 miles between Euston and Crewe might also be expected to occupy a high place, though in this case the loops from Roade to Rugby via Northampton, and from Rugby to Stafford via Birmingham and Wolverhampton, relieve nearly half this distance of a good deal of its traffic. But for a distance in the neighbourhood of 200 miles the palm must probably go to the P.L.M. Railway of France, over its main line between Paris and Dijon, which carries the whole of the traffic to and from Lyons, Marseilles and the Riviera; the Mont Cenis route for Italy; Switzerland by the Simplon route; Geneva and the popular resorts of the French Alps. An article on page 822 of this issue briefly describes the extraordinary traffic carried by the Paris—Dijon main line before and after Christmas last, when between 7.30 p.m. and 12.30 a.m. on December 23 51 *rapide* and express trains left the Gare de Lyon at Paris, almost all for destinations over 400 miles away, and 47 travelling over the same route for 196 miles to Dijon, at intervals averaging from 6 to 7 min. apart. The record is the more remarkable in that much of the distance is still only double track, though quadrupling throughout is now in progress.

* * * *

High-Speed Reliability

The fact that the L.N.E.R. Silver Jubilee express had recently to be stopped owing to heating trouble in one of the axleboxes of the restaurant car set brings into prominence the remarkable record that has been maintained by this set of cars, for this is the first casualty to the train itself, apart from the locomotives, that has taken place in actual running during the eighteen months that it has been in service. Each week during that period these coaches have run 2,323 miles at a scheduled average speed of 70·4 m.p.h., and fully 1,500 miles at a running average of over 75 m.p.h., with maxima of at least 90 m.p.h. on every journey. Apart from the Saturdays and Sundays at each week-end, the only opportunities for complete overhaul have been times round about Christmas and Easter, when the train spends about a week out of action in each case. During the same eighteen months there have been only two locomotive failures in running which have caused delay to the train, and it is a singular coincidence that one of these should have taken place on the day after the coach casualty previously referred to. Four locomotives have been allocated to the service, but one of them, which is stationed at Newcastle as a reserve in case of need, has actually spent very little of its time on the train, the remaining three having shared between them the task of maintaining the service. The L.N.E.R. is entitled to congratulation, not merely in having inaugurated Britain's first high-speed long-distance train, but also in having proved that high speed service of this description is a practical and reliable proposition.

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Level Crossings in Germany

Considerable progress has been made in Germany in recent years in the elimination of level crossings, or the provision of improved protective equipment at those which remain. During the years 1933 to 1936, no fewer than 1,493 crossings have been replaced by bridges or rendered unnecessary by road deviations. Automatic warning light signals were installed at 137 crossings last year, and about 1,880 crossings were provided with the approach warning boards already described in our columns, while at many others the lighting was improved, especially where barriers exist. Nevertheless, during the first 9 months of last year there were 14 more collisions at crossings, 7 per cent. more, than for the same period of 1935, 216 road vehicles being run down or driven into trains. Forty-five cases were due to the neglect of the railway watchmen, 171 to the carelessness of road drivers. There were five serious cases, involving 11 deaths and 51 persons injured. In one case the train involved in the collision was derailed. The carelessness of many road drivers is now attracting the special attention of the highway police.

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Running Shed Repairs

No scheme of locomotive depot reorganisation could be considered complete which did not provide in ample measure for carrying out engine repairs in a properly organised manner. The provision of such facilities forms an essential part of the L.M.S.R. Motive Power Department reorganisation scheme, of which further details are given on pages 803-811 of this issue. The heavier running repairs are carried out at the main, and the lighter ones, consisting largely of adjustments and other minor operations, at the sub or garage depots. The illustrations reproduced in the article referred to include a view of the two adjoining depots at Rugby, and it is significant of the principle followed that whilst several engines are to be seen near the main depot, the yard outside the garage is entirely clear, showing that the purpose and character of the latter is being properly observed. Locomotive casualties and the effects they produce on train movements are matters of vital importance seeing that the reactions from a single casualty may extend over an area of 100 to 200 miles with consequent detriment to punctual working and in other directions as well. This aspect of the matter has been given full consideration in the L.M.S.R. scheme, and out of it has arisen the formation of a Motive Power League, the object of which is to create added interest among the staffs in the maintenance of the company's locomotives, and stimulate a healthy rivalry as between one depot and another.

XUM

Iraq Railways

MOVEMENTS of grain were smaller during the twelve months ended March 31, 1936, and this was reflected in a lower purchasing power of the community in certain districts, with consequent less receipts from goods traffic. Moreover, the completion of the new refinery of the Anglo-Iranian Oil Company at Kermanshah involved the cessation of the passage of materials, machinery, &c., in connection therewith, and the final stoppage of transit oils from southern Iran via Iraq to north and north-western Iran. Transit trade to Iran has also been reduced to very small proportions. There was, however, an increase of traffic passing from Iran via Khanaquin City over that passing in the reverse direction, as Baghdad is still a market for indigenous products of Iran which pass through Iraq *en route* to Europe and America. Nevertheless the administration was able, as hitherto, to make the full annual provision for renewals, replacements, and betterments and by reducing expenditure to the minimum compatible with safety and efficiency to show a surplus of revenue over expenditure in the year under review.

Disturbances in the middle Euphrates area caused an interruption from May 8 to May 23, 1935, in through running between Baghdad and Basra and seriously affected the whole trade of the area. In addition the prohibition by the Government of the use of the Euphrates barrage at Hindiya as a bridge for the crossing of trains continues to cause the utmost inconvenience to passengers to and from Kerbala as well as a diminution of railway receipts and an increase in working costs. The mail train service inaugurated early in the year between Baghdad and Basra brought an increase in upper class passenger traffic. The passenger route to and from Europe by the Simplon-Orient express has increased in popularity. Upon the representation of the Iraq administration the time-table of the Taurus express was altered so as to make direct connection with Paris and London via Munich and via Ostend possible. Further, at the conference held in October, 1935, proposals by the Iraq administration for the inauguration of tariffs by the Ostend-Vienna-Orient express and the Arlberg-Orient express routes were eventually accepted by the administrations interested. This has made possible the introduction of reduced fares by these routes to and from London and Paris and stations in Iraq on the same basis as those applicable by the Simplon-Orient express route. In goods traffic the average haul fell from 328·85 km. in 1934-35 to 289 km. in the year under review. Some operating figures for the two years are compared in the accompanying table:—

	1935–36	1934–35
Passengers	2,053,606	2,112,711
Revenue-earning goods, tons	463,639	574,434
Goods ton-kilometres	168,284,722	227,430,170
Train-kilometres	2,276,871	2,256,217
Operating ratio, per cent.	98·1	89·6
	Dinars*	Dinars*
Coaching receipts	175,197	163,189
Goods receipts	324,331	400,442
Total earnings	508,888	572,107
Working expenditure	499,100	512,714
Net earnings	9,788	59,393

Experiments were continued in connection with the ventilation of coaches and the exclusion of dust by filtering and cooling the air. The two metre-gauge 27 ft. saloons which were built in shops during the year have been fitted with such apparatus. During the year the mechanical system of accounting by the aid of paramount cards was applied to the preparation of statistics. The process was introduced in December, 1935, and with experience is expected to result in increased speed and accuracy and to lead to material savings in the staff of departmental offices. As a result of the agreement which was finally ratified in July, 1936, the transfer of the railways from the present administration to the Iraqi Government was to become effective as from April 1, 1936, *i.e.*, after the close of the period covered by the present report.

* The Iraq dinar is nominally equivalent to £1.

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Rail and Road

IT has been repeatedly stated on behalf of the railways that the keystone of the rail and road problem is the inequality of the legislative conditions under which the two methods of transport are conducted. The most recent exposition of this was the passage in Sir Josiah Stamp's speech at the recent L.M.S.R. annual meeting where he observed that "when the conditions and regulations governing the respective forms have been as far as possible equalised we are ready to let the division of traffic settle itself upon purely economic lines, subjecting, however, the particular interest of sections of the community to any overriding considerations which may be necessary in the interests of the country as a whole." Sir Josiah's meaning is clear enough but what is not so obvious is what is meant by equality. During the last twelve months the subject has been related mainly to merchandise traffic and here there are seven aspects where inequality exists. These may be summarised thus:—

(1) classification of charges;
(2) regulation of charges;
(3) publicity of charges;
(4) non-discrimination;
(5) protection of coastwise shipping;
(6) provision of facilities; and
(7) control of profits.

The railway argument is that these inequalities should be removed and presumably that either the railways should be freed from the existing control which applies to them only, or equivalent control should be extended to road transport. In considering these alternatives there are, of course, numerous additional complications, such as the "C" licence holder, which cannot be lost sight of, but here we are concerned with the main features of the issue. It is widely recognised that there cannot be complete freedom, and the first alternative can therefore be dismissed without difficulty. As regards the second alternative, the vital question is how far is it possible to extend the railway controls to road transport while preserving the existing competitive commercial systems. That is presumably the problem which now facing the Transport Advisory Council in its attempt to co-ordinate the various methods of transport. It is clear that co-ordination must mean bringing the transport systems into closer relationship for the carriage of merchandise if the inequalities previously mentioned are to be removed.

Obviously, each method of transport is concerned with the effect of such closer relationship on itself; in other words, it is a condition precedent that each side must benefit either by increased income or the prevention of further encroachment. There are many pitfalls here and little can be guaranteed. The word "co-ordination" has been considerably overworked since the Royal Commission Report in 1931. It is easy to say glibly that co-ordination will solve the transport problem, and indeed that ready generalisation may be right, though it is a very different problem from that which has faced the London Passenger Transport Board where there is common ownership. Where ignorance is bliss is it folly to be wise? It has been reported in some quarters that the Transport Advisory Council is hopeful of making its recommendations to the

Minister of Transport in a month's time. In our opinion, however, there should be no attempt to rush proposals forward; the subject is of vital importance and any scheme will require very careful consideration before it is recommended.

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Railway Development of Jugoslavia

APART from the U.S.S.R., few European countries can boast so much railway expansion and development since the war as Jugoslavia. After the initial rehabilitation of permanent way and rolling stock, ways and means of unifying the system were evolved. The ex-Serbian 4 ft. 8½ in. lines had contact with the remainder of the system only at Belgrade, and the 2 ft. 6 in. gauge sections had no connection with the ex-Bosnian—Herzgovinian system of that gauge. Consequently the Uzice—Vardiste connecting link was begun in 1919, but owing to the very great engineering difficulties encountered it was not opened until 1927. These 43 miles of line involved not only very steep gradients and sharp curves, but many tunnels, some of them spirally aligned. The opening of this line completed a 469-mile all-narrow-gauge line between Belgrade and the Adriatic at Dubrovnik, as compared with the former shortest route, 506 miles, via Slavonski Brod and Sarajevo, which involved a break of gauge at the former junction. The new line also gave direct communication between the eastern and southern areas of central Jugoslavia (as shown on the sketch map on page 798), and has proved an important link from every point of view.

Meanwhile in 1925 the standard gauge single line from Zagreb to Gospic had been extended to Knin, a distance of 68 miles, and an alternative to the Zagreb—Sušak connection between the main trunk route and the Adriatic had thus been completed, and standard gauge access to the ports of Split and Šibenik was in this way established. As, however, this route rises to two summits 2,602 ft. and 2,894 ft. above sea level, 72 miles apart, and is very exposed, it suffers considerable and frequent interruptions due to snow in the winter months; also it forms a very roundabout way from Belgrade to Split. Consequently a new short-cut, which will not be so vulnerable to snow, is at present under construction between Bihac and Knin, in extension of the standard gauge Sunja—Bihac branch off the main line. This new 69-mile construction is expected to be ready for opening in 1940, and will provide a 427-mile through standard gauge connection between Belgrade and Split, as compared with the existing 529-mile route via Zagreb. This new line will parallel the privately-owned narrow gauge line for about 40 miles between Drvar and Knin.

The important Kosovo Polje—Pec—Kotor (Cattaro) connection was dealt with in our issue of May 29 last. It will be remembered that it forms an integral part of the future through route from Roumania via Nish to the Adriatic. We now understand, however, that the intention is to bridge the Danube at Prahovo and not at Turnu—Severin, leaving the Roumanian railways to link up with this bridge. The Pozarevac—Kucevo extension was also referred to in that issue, as forming a part of the future connection between Belgrade and this bridge, a route that will directly link up the Jugoslav and Roumanian capitals. The Veles—Prilep line, completed in 1935, was, moreover, mentioned, as was the Belgrade—Pancevo link over the new Danube bridge. Other broad gauge lines at present under construction are: (1) Kocevje—Vrbovsko, a 25-mile line directly connecting the Adriatic ports of Sušak and Split with Austria via Ljubljana junction; (2) St. Janz—Dolenskom (a five-mile short cut that will give direct access from the St. Jans coalfield to the Zagreb—Ljubljana main line); (3) Koprivnica—Varazdin (a 25-mile chord line near the northern frontier); and (4) an important standard gauge system to open up south-central Jugoslavia, comprising the Banja Luka—Kraljevo west-to-east and Brod—Sarajevo north-to-south lines. A description of this new system and its relationship with the existing narrow gauge lines in the same area is given in our Overseas columns on page 796. Some additional 2 ft. 6 in. gauge lines are also being built, namely, the 44-mile section from Bileca, near Dubrovnik to Niksic, and a 26-mile line from Ustipraca to Foca running up the upper Drina valley. It will thus be seen that the remarkable railway expansion of Jugoslavia manifest since the war is being continued with unabated persistence at the present time, and the aims of this policy—the welding together of all the various parts of the country into a homogeneous State, and the encouragement of trade—should be attained if any policy can secure this end.

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Relay Interlocking at Leeds

THE power signalling recently completed at Leeds New station and described on page 813 is an indication of a trend which has been growing of recent years in this country, the important first step towards which was taken in 1929, when the Southern Railway installed at North Kent East Junction the first locking frame in Great Britain to have no mechanical locking. A stage further was reached in the centralised traffic control installed in 1932 on the Stanmore branch of the London Passenger Transport Board by the operation of points and signals from a control panel instead of a locking frame, and this was followed in 1933 by a much larger panel with relay interlocking in the North Eastern Area of the L.N.E.R. at Thirsk. At Leeds we see the principle of relay interlocking applied to a large city station where the traffic necessitates a considerable amount of shunting. This should in due course enable a comparison to be made, based on all the facts involved, between that system and the more conventional form of power working installed at some other large stations in recent years. Except in the case of the London Passenger Transport Board, all new power signalling installations in this country for the last 17 years have been of the all-electric type, which makes the selection of electro-pneumatic point operation for Leeds especially interesting. Probably the experience gained with that system on the former North Eastern Railway at Newcastle and Hull has influenced this decision.

The control panel in the new Leeds West signal box covers about 4½ track miles and operates 88 signals and 64 pairs of points. We understand that the question of adopting the route setting principle was given very careful consideration, with a view to reducing to a minimum the number of movements to be made by the signalman, but owing to the complexities of the layout the individual principle was considered to be the more economical. Although mechanical interlocking is absent between the point and signal operating switches, it is used between the push buttons controlling the approach lock releases.

The changeover was carried out between 11 p.m. on Saturday, April 3, and 3 a.m. on Monday, April 5, and was rendered more difficult owing to the amount of demolition work required. To give an uninterrupted view eastwards from the new box, the old West box had to be completely dismantled, this work being completed by 2 p.m. on Sunday; but despite the fact that track circuits were often occupied by ballast trains, and points frequently could not be moved for testing purposes, all the new connections were completed early on Sunday afternoon.

XUM

During the changeover period practically all passenger trains were diverted into either Wellington or Central stations. When dealing with the resignaliing at Leeds East, in our issue of July 3, 1936, we referred to the interesting manner in which an obsolete signal cabin, due for replacement, was converted into a thoroughly up-to-date structure, conforming to the best modern practice of the North Eastern area of the L.N.E.R.; in the new West box the notable design used for Thirsk has been adapted to the requirements of a large interlocking with no little skill. Commodious well-lighted rooms have been provided for housing the large number of relays required for interlocking, track and point indication circuits, and a well-planned layout of the equipment combined with a building of handsome appearance, both inside and out. Altogether this is a noteworthy installation which will be studied with great interest by signal engineers and operating officers alike.

* * * *

San Paulo (Brazilian) Railway

ON the main line of 86½ miles on the 5 ft. 3 in. gauge from the port of Santos inland to Jundiahy the traffic receipts showed in the year 1936 an increase of 20,716 contos, or 19·27 per cent., and in sterling of £263,641. Net revenue of this section was £155,452 higher, at £535,446. On the Bragantina section of 67 miles (metre gauge) there was a loss on working of £7,905 despite an increase of 13·81 per cent. in currency receipts. The operating ratio in currency in Brazil for the whole system was 65·97 per cent. in 1936, against 71·28 per cent. in 1935. There was an increase of 492,052 passengers and in general merchandise, coal &c., an increase of 626,914 tons, although the tonnage of exported coffee fell from 725,691 tons to 670,919 tons. Receipts in currency also benefited from the increased tariffs in operation throughout the year. The average rate of exchange at which remittances were made during the year was 2·85743d., against 2·81949d. during 1935. The general financial position is indicated in the accompanying table:—

	1936	1935
	£	£
Gross receipts	1,550,321	1,283,530
Expenditure	1,123,394	995,982
Net receipts	426,927	287,548
Income from investments, etc.	64,523	268,032
Total net income	491,450	555,580
Debenture interest and other charges ..	278,492	439,768
Dividends	200,000	125,000
Brought forward	20,869	30,057
Carried forward	33,827	20,869

Income from investments, &c., in 1936 includes £37,345 transferred from bridge renewal fund, and amongst " other charges " are £72,684 to rolling stock replacement reserve, £31,147 to difference in exchange, and £51,171 payable to the associated road company under agreement. The 1935 investment, &c., income included a transfer of £250,000 from reserve, and amongst the " other charges " in 1935 were £130,000 placed to bridge renewal fund, £73,180 for rolling stock replacement, £43,702 for loss on exchange, and £37,148 to the associated road company. Out of 158,000 tons of goods carried in 1935 in the road vehicles 132,000 tons were handed to the railway in mutual traffic and about £44,000 was paid to the railway in freights. Road passenger services in 1935 carried some 330,000 passengers compared with 77,252 in 1934. The dividend of 5 per cent. for the year 1936 on the ordinary stock compares with 2½ per cent. for each of the two previous years.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Engineering Institutions

London, April 19

To the Editor of The Railway Gazette

Sir,—The value of engineering institutions and associations at whose meetings papers are read and discussed is beyond question, and to be able to style oneself a member of one or more of the well-established bodies of this kind is, to my mind, a privilege and an honour. It may, however, easily become less so if institutions, in order to increase their membership, extend that privilege to persons whose lack of knowledge and experience does not qualify them to possess it. The membership grading principle should be rigidly enforced and only those who have had actual training as practical engineers and whose subsequent experience justifies it should be admitted to full membership; otherwise the very title of the institution is in danger of becoming a misnomer. Honorary membership is another thing altogether, the term carrying with it, its own special meaning.

Yours truly,

LOCO. ENGINEER

An Abandoned 335-mile Railway

21, East 87 Street,
New York, March 29

To the Editor of The Railway Gazette

Sir,—Abandoned railroads in the British Isles refer only to small lines such as the Bideford, Westward Ho! and Appledore. In the United States, on the other hand, at least eleven entire railroads over one hundred miles long have been abandoned.

The longest of these is the 335-mile Colorado Midland Railway, which extended from Grand Junction to Colorado Springs. Skirting the famous Garden of the Gods, winding about the base of Pikes Peak, and crossing the most rugged region of the Rocky Mountains in a series of canyons culminating at Hell Gate, it was considered by many to be the most scenic railroad in America. Its two-mile tunnel under the Continental Divide at an elevation of over ten thousand feet was a remarkable achievement.

The road was built in 1887 to serve the mining camps of Leadville and Aspen, but later extensions made it an important link in transcontinental traffic. Although the " Midland Route " was 77 miles shorter than the competing Denver & Rio Grande Railway, it was abandoned in 1918, largely because of its steeper grades and sharper curves. The road crossed the mountains at such a great altitude that in 1899 a 45-foot fall of snow closed it for almost three months.

Very truly yours,

WILLIAM B. SCHALLEK

L.M.S.R. Pigeon Specials.—In readiness for the 1937 racing pigeon season, the L.M.S.R. has planned to run " pigeons only " trains, which, it is estimated, will carry during the season over 2,000,000 birds. The L.M.S.R. regards the pigeon traffic with such importance that it has produced for the information of the railway staff a 70-page booklet dealing with the care of pigeons from the time they come into the company's hands until they are released for the homeward journey. This year's plans cover the activities of over 100 pigeon racing organisations, the greater majority of which are situated in the North (including over 40 in Lancashire and 15 in Scotland), and the remainder in Yorkshire, the Midlands, and the West of England. In addition to the large number of baskets of birds which will be carried in the ordinary guard's vans, over 2,000 vans will be specially provided by the L.M.S.R. during the season for the pigeon traffic alone.

PUBLICATIONS RECEIVED

Modern Railway Welding Practice. By Dipl.-Ing. O. Bondy. London: The Railway Gazette, 33, Tothill Street, S.W.1. 8½ in. × 5½ in. 128 pp. Illustrated. Price 5s. net.—In a foreword to this book Sir Harold Hartley describes it as a most useful contribution to the somewhat scanty literature of welding, which he feels sure will make an instant appeal to railway engineers. Most of the previous literature on the subject has been concerned with welding technique, and Sir Harold Hartley congratulates the author on diverting attention from the tactics to the strategy of the subject. The book originated in a series of special articles in *The Railway Engineer* and THE RAILWAY GAZETTE dealing with various branches of railway practice in which welding has proved satisfactory. The aim is to provide concise information on a number of specific fields of application for welding and to afford assistance to engineers in practice—whether at the drawing board, in the workshop, or on the site—in the further development of new and important applications of welding technology. The author's examples are drawn largely from German practice, Germany having been a leader in new welded construction, not only of rolling stock but of bridges and of buildings.

After a general survey of the subject, the author deals in Chapters II to IV with the application of welding to rolling stock. Chapter V is devoted to welding regulations in various countries with particular reference to those of Germany; then follow chapters on new welded railway station roof structures and bridges, and the strengthening of bridges. A special chapter is devoted to the Rügendamm Bridge in Germany, of plate girder design, and one of the most remarkable welded structures so far built. There is also a chapter on the welding of rails, and the volume concludes with a useful index. Altogether Sir Harold Hartley's description of the book as concise, readable, and well illustrated, dealing in turn with almost every aspect of railway engineering in which welding has been applied, is well merited.

Fifty Years on the Railway. By A. Stokes, Shirley, Birmingham. Foreword by Sir Josiah Stamp. Printed by the Cornish Riviera Press, Ltd., and published by the author at 171, Marshall Lake Road, Shirley, Birmingham. 7 in. × 4¾ in. 74 pp. Illustration plates. Price 2s. net.—The work of a recently-retired signalman who saw 52 years of service on the Great Western Railway in the Birmingham district, this little book of reminiscences, essays, and verse, is an interesting addition to those all-too-rare volumes in which are presented for the enjoyment of others the experience and incident personal to the life of a railway worker. The author confesses his limitations of literary style at the outset, but his homely and cheerful manner of expressing himself will appeal to all. His first full time employment was of a very multiple character as he held no fewer than six daily jobs simultaneously! Of his early days on the railway Mr. Stokes has many amusing anecdotes to relate; one concerns an intrepid old dame, who, refusing to use the bridge at Olton station, made a spectacular crossing of the line in front of an express train. "Well" was her calm rejoinder to the horrified reproaches of the stationmaster, "it only touched my dress!" On the graver side, the author compares the present and past duties of a signalman and gives an interesting personal opinion on this subject. In a chapter entitled "Reflections on the Broad Gauge," he speculates on the "might have beens" had this gauge become standard in this country. The volume ends with some examples of Mr. Stokes' abilities as an essayist, and a poet, wherein he shows a delightful fancy and a great deal of imagination. The author has generously offered the proceeds from the sale of this book to the Solihull New Methodist Church Building Fund.

Clyde River and Other Steamers. By C. L. D. Duckworth and G. E. Langmuir. Glasgow: Brown, Son & Ferguson Limited, 52-58, Darnley Street, S.1. 8½ in. × 5½ in. × 1½ in. 254 pp., including two appendices and index, with profuse illustrations from photographs. Price 7s. 6d. net.—This book is a companion to "West Highland Steamers" by the same authors, reviewed in THE RAILWAY GAZETTE of January 19, 1935. This time they have extended their scope to take in not only the MacBrayne fleet in 1935-36, but all passenger and regular coastal craft plying in Clyde waters, together with such other vessels as the *Dunara Castle* and the *Hebrides*, which maintain an all-the-year-round service between the Clyde and the Western Isles, with occasional trips as far afield as St. Kilda. Turning for a moment to matters of ownership, it is recorded that the five Williamson-Buchanan vessels which passed under L.M.S.R. control on October 3, 1935, being included in the Caledonian Steam Packet Company's fleet, are now run by a new concern, Williamson-Buchanan Steamers (1936) Limited. This company was formed on March 31, 1936, and is controlled by the L.M.S.R. group.

Many interesting vessels are dealt with under the heading "Other Steamers," among them being the *Aglaia*, which, built about 1820 and believed to have plied on the Loch Eck service, was the first iron steamer in the world. Her designer, David Napier, ran steam coaches in connection with her sailings, thus establishing a precedent for the modern combined motor-coach and steamer excursion. Full attention is naturally given to the latest additions to the Clyde fleets, such as the turbine steamer *Marchioness of Graham*, built for the L.M.S.R. in 1936.

L.P.T.B. Railway Map.—The London Passenger Transport Board has prepared a new style of map of the London Underground railway system. "Underground," incidentally, in the board's own parlance now covers all the railways controlled from 55, Broadway. This new map—and it *is* a map—replaces the old diagram of lines formerly published by the board and its predecessors. In addition to geographical rectitude, an important feature of the map is that it shows, for the first time in an official publication, the Underground extensions now in the course of construction. On the reverse side there is an enlarged section of the central London area, together with a key to places of interest.

Travelling South, in the Reigns of the Six King Georges.—The Southern Railway has published a novel and entertaining booklet for free distribution to visitors arriving in this country at the company's ports. As indicated by the title, it outlines the evolution of passenger transport to the Sunny South from the lumbering stage coach of 1714 (King George I) to the luxurious Brighton Belle and other electric expresses of 1937. The illustrations throughout are the work of the well-known black and white artist, Miss Helen McKie, who has also written the text. Some indications of the travel facilities available today, such as specimen fares and itineraries, are given as well. The book is both a pleasing souvenir of the Coronation year and a handy little work of reference.

Driving Ropes.—We have received from R. & J. Dick Limited, Greenhead Works, Glasgow, S.E., an illustrated catalogue dealing with Dick's Element driving ropes (Dixel ropes). Characteristics of this form of drive are a large surface of contact and easy joining. When used in replacement of rubber vee ropes, or cotton ropes, it will be found that the same power can be transmitted with fewer Dixel ropes. Two classes of ropes are manufactured—Balata for all general purposes, and Dixit for exceptional conditions of heat and speed. This booklet gives useful data for selecting and installing Dixel drives, and includes several pages of illustrations showing the ropes in use for varied types of power transmission.

Practical Excavating.—Ruston-Bucyrus Limited, Lincoln, has published an illustrated booklet showing the numerous applications of the 10-RB ⅜-yd. universal excavator. This, the smallest excavator in the Ruston-Bucyrus range, is exceptionally light and mobile. Power may be by diesel engine, petrol, or petrol-paraffin engine, or electric motor, according to choice. Extensive use has been made of alloy steels in the construction of this excavator, together with the judicious combination of castings and welding. The equipment comprises ⅜-yd. bucket, shovel, dragline, drag-shovel, skimmer, grabbing crane, or it may be operated as a crane.

THE SCRAP HEAP

Answer to Railway Problem No. 2

4½ miles. Train goes 1½ miles while bus goes 1. ∴ train gains ½ mile for every mile by bus. ∴ train gains 1½ miles in 3 miles by bus. ∴ bus route is 3 miles, train 4½.

* * *

Railway Problem No. 3

A MODERN MYSTERY

A man had occasion to travel on a certain day from London to York in connection with a business appointment. On the morning of his departure from home to keep this appointment, his wife accompanied him to the station, bid him goodbye, saw him depart by train and waited on the platform until the train had left the station. The train by which the man travelled from London to York proceeded thither without stopping. On reaching York, he left the train without delay, and the first person to greet him on the platform was his wife from whom he had so recently parted.

She had travelled neither by road, nor by air, nor by the train which conveyed her husband. How did she manage to get to York?

Only two people, the man and his wife, are concerned in this affair.—*From "A Problem a Day," by R. M. Lucey. Faber & Faber. 5s. net.*

* * *

RAILROAD GIVEN TO CHARITY

Arrangements are being made for a change in the control of the Van Sweringen "railroad empire," and charities will benefit to the extent of about $10,000,000, according to Reuters reports from New York. Mr. George A. Ball, together with Mr. G. A. Tomlinson the Cleveland shipping man, in September, 1935, bought the control of this railway system at a public auction from the J. P. Morgan Company for somewhat over $3,000,000. Mr. Ball now controls the system through the Mid-America Corporation. The latter has recently received several propositions for the sale of this control, but so far the possible buyer has not been disclosed. It is stated, however, that Mr. Ball, who owns 90 per cent. of the outstanding common and preferred shares in the Mid-America Corporation, is parting with his holdings and is donating the estimated gross profit of $10,000,000 to charity.

* * *

At the Islington workshops of the South Australian Railways, 800 men performed the same amount of work with modern machinery in 1929 as 1,800 men did in 1925 [with older machines]. — *From the "Oamaru Mail."*

* * *

THE GOLDEN JUBILEE

According to the *Daily Herald*, the L.N.E.R. Silver Jubilee express is appreciating considerably in value. "Wrecked wagons being cleared from the line after a railway collision at Thirsk, Yorkshire," we read under a picture recently reproduced by that journal. "A parcels train and a goods train were involved, and several expresses, including the Golden Jubilee, had to be diverted."

Reproduction of a recent Southern Railway poster, of which the original is in bright colouring

Down with damage and delay ! !
They destroy dependability on which reputation and livelihood depend

WE MUST

Faithfully fulfil orders;
Faithfully keep to time;
Faithfully deliver intact;
Faithfully maintain the highest standard in transport—
So that we can confidently sign ourselves

Yours faithfully

No. 9 of a new series—the third—of "claims prevention" posters issued by the Chief Goods Manager, G.W.R., for exhibition to the staff

A remarkable level-crossing accident occurred on the Nanking—Shanghai Railway on March 8 at Quinsan, when an express struck a motorcar on the crossing, the car landing in a field upright on its wheels completely shattered and the driver still sitting in his seat dead. The train appears to have hit the car squarely in the middle, throwing it off the track and to have thus averted a disaster to itself.

* * *

Children under six years of age are to travel free on the Japanese railways from June 1, if accompanied by adults. Children between the ages of six and twelve will from that date have to pay only half fare. At present only children under four years of age travel free.

* * *

"The *Railroad Gazette* proposes the following: To have an anchor to drop from the rear end of train and engage with the ties. . . . By having a good long spring to ease the shock when the anchor came to a bearing, in addition to the relief which would come from the draw springs of the entire train without any expense at all, a train might easily be brought to a stop within 15 or 20 feet from an ordinary passenger speed, if something did not give way." (!)—*From the "Scientific American" of January, 1887.*

* * *

The British railways own and operate 42,656 passenger carriages, including 373 sleeping cars (both first and third). Some 323 camping or caravan coaches are available during the summer months.

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

CEYLON

Re-classification of Locomotive Stock

The Government Railway locomotives have recently been reclassified, as the old class names were somewhat peculiar and conveyed little to other than those directly concerned with them. The "H.L. Sup." class for instance was Hawthorn Leslie built; "Old Noa," "Mannar Sat.," "K.V." (Kellani Valley line), &c., were after place names, and "Big Bank," "B.T." (Big tank) were designated according to their designs.

In the new classification classes "A.1" to "A.3" are varieties of the 4-8-0 type engine; "B.1" to "B.10" are ten different 4-6-0 types; "C.1" is a Garratt 2-6-2 + 2-6-2; "D.1" to "D.3" classes are 2-6-4 tank engines; "F.1" to "F.3" are 4-4-0's; "G.1" is a diesel shunting engine; "H.1" is a 2-4-0 + 0-4-2 Garratt; "J.1" and "J.2" are 4-6-4 classes; "K.1" is a small 4-4-0; and "L.1" a 0-4-2.

New Green Livery and Named Engines

The "B.1" class engines are being named after past Governors of Ceylon, and No. 4 *Sir Edward Stubbs* and No. 286, *Sir Greame Thompson*, have been turned out in light green livery (B.S. colour No. 25). No. 262 of this class, has been named *King George VI* and will leave the workshops during Coronation week in the new livery. We are indebted to Mr. W. A. Smyth the Mechanical Engineer, for this information.

VICTORIA

Broadcast Campaign

The Government Railways have entered into contracts with five city and five country broadcasting stations in the largest radio publicity campaign they have yet undertaken. There are 38 railway broadcasts from the city stations each week on weekdays and two from selected country stations. Fare concessions, special trains and holiday travel, train accelerations, luggage facilities, air-conditioned travel, and freight concessions to primary producers are some of the features broadcast.

The First V.R. Buffet Car

The first buffet car is being introduced on the Government Railways and will be fitted with air-conditioning and have a special decorative scheme. It will be run on the Melbourne—Bendigo line, making two trips daily. A standard coach is being converted for the purpose; there will be a 42 ft. buffet compartment, and three first-class compartments. Concealed lighting, two refrigerators, and a plate-glass partition between the kitchen and corridor—enabling passengers to observe the methods of the kitchen staff—are among the special features in the car, as are also the ventilation of and fumes extraction from the kitchen in connection with the air-conditioning plant. Entrées, grills, sandwiches, soft drinks, ice cream, fruit, confectionery and other light refreshments will be served in the buffet.

GREECE

£12¾ Million Public Works Loan

A ten-year programme of public works is being launched in this country, and to finance it a 7,000,000,000-Drachmae (about £12¾ million) loan is being floated. The works entailed include road making and the development of existing road systems, irrigation and drainage, harbour improvements and railway works, but no programme has yet been framed.

Railway Orders Placed in Germany

Last year the Government approved the negotiation of a loan from the Bank of Greece by the Hellenic State Railways for 200,000,000 Dr. (£363,600), and a commission headed by General G. Spyridonos—then General Manager of the system and now Minister of Railways—went to Berlin last June and placed orders with various German firms for railway material to the value of the loan. The material included steelwork for the construction and strengthening of bridges, steel sleepers, structural steelwork, 24 new passenger coaches, machine tools, travelling cranes, inspection cars, &c. The value of the sleepers was over ⅓ and that of the coaches over ¼ of the total involved.

INDIA

Inquiry into Railway Union's Complaint

Shortly after the settlement of the B.-N.R. strike, the railway administration withdrew its recognition of the Bengal-Nagpur Railway Indian Labour Union. The President of the union thereupon protested to the Government of India against this course of action, and further complained that the railway administration had failed to implement the terms of settlement of the recent strike as communicated by the Agent in his letter of February 6 to the President of the union. Mr. V. E. D. Jarrad, Agent of the B.-N. Railway, who was recently at Delhi, discussed the situation with the Railway Board and with the Hon'ble Member for Industries and Labour. The Railway Board subsequently announced the appointment of Mr. R. F. Mudie to inquire into and report on the allegations made by the union. He is also to report whether the action of the B.-N.R. administration in withdrawing recognition of the union, as at present constituted and administered, was justified, and whether the continued withholding of recognition is desirable. The inquiry has the full concurrence of the Agent of the line.

Buffaloes Cause Derailment

On the night of March 28, a train on the Khulna-Bagerhat Light Railway was charged by two buffaloes. One of the animals got entangled between two coaches and was killed under the wheels, but not before it had caused a derailment. The wheels of one coach were detached in the impact with the animals. A few passengers received minor injuries.

FRANCE

P.L.M. Automatic Signalling

Some few years ago, after sending a commission of inquiry to the U.S.A. to study the subject, the P.L.M. decided to adopt automatic signalling on its main lines in order to obtain much shorter block sections, necessitated by the increase in the number of fast trains following each other at close intervals at certain hours of the day. Towards the end of 1935 the first section of colour-light automatic signalling was brought into use between Villeneuve—St. Georges and Combe-la-Ville—Quincy, a distance of 12 km. (7½ miles), and gave entire satisfaction. A further section has now been opened between the first-named station and Corbeil-Essonnes, a distance of 18 km. (11¼ miles), including the important junction station at Juvisy.

Where ordinary signal-boxes exist the usual controls have been added to the light signals, with illuminated diagrams, electric locking, and telephones for the use of crews of trains stopped by signal. The smaller stations, with key-locked points or ground frames, have electric frames enabling the stationmaster to control the home signals when necessary. Standard cab signalling has been adapted to the "caution" indications of the signals, and automatic detonating machines provided to supplement the "stop and proceed" (automatic) or "stop" (controlled) aspects, as on some other French lines.

Further Automatic Signalling in Hand

Further work is in hand between the Gare de Lyon (Paris) and Villeneuve, 15 km. (9¼ miles), and is to be finished in time to handle the extra traffic occasioned by the exhibition.

The P.L.M. adopted automatic signalling, with ordinary semaphore and disc signals, between Laroche and Cravant as long ago as 1900, but has been content with its own excellent lock-and-block apparatus elsewhere until these recent installations, supplementing it, however, with continuous

track circuits over many miles of line. It is intended that the entire main line from Paris to Marseilles shall in due course be signalled automatically, but the Paris suburban area is to be equipped first.

JUGOSLAVIA

Important New Constructions

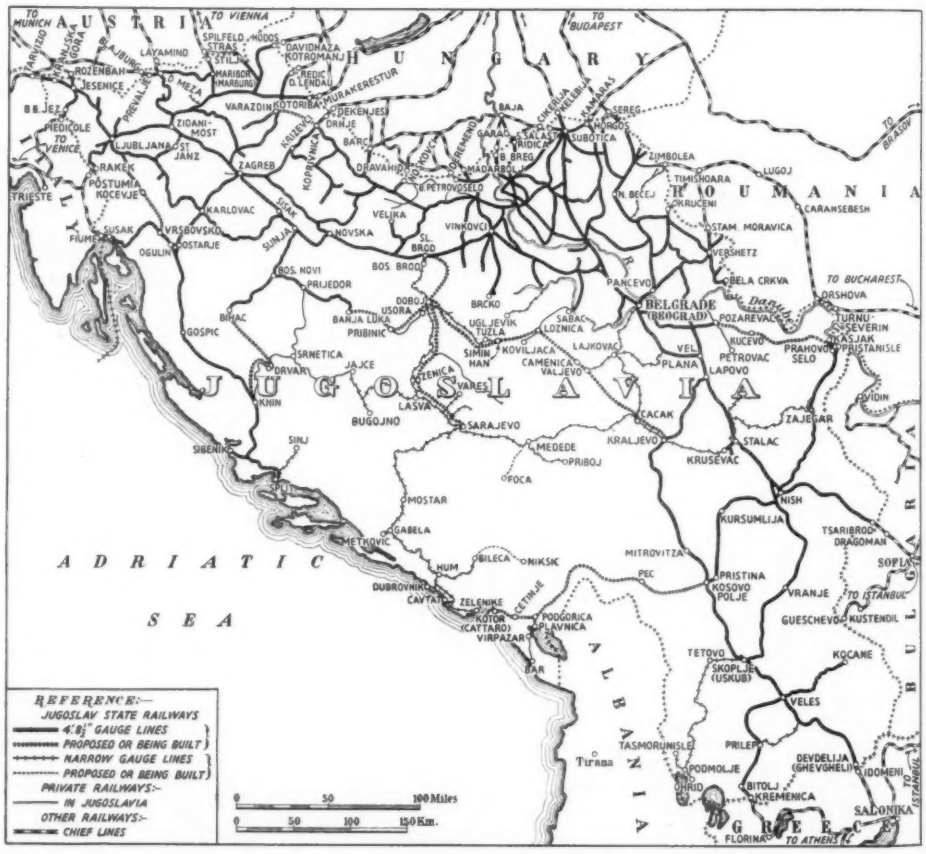
[The editorial on page 793 may, with advantage, be read before this Overseas letter.—ED. *R.G.*] At the present time there is a complete absence of standard gauge lines in south-central Jugoslavia south of the River Save —the former Bosnia, Herzegovina, Montenegro and Western Serbia—and there is no through narrow gauge route either, as the Jajce—Srentica—Prijedor line is merely an industrial light railway unsuitable for transit traffic, and the Belgrade—Cacak—Sarajevo main 2 ft. 6 in. gauge route serves only the eastern half of the area under consideration. This paucity of effective communications and the fact that it was decided last year to extend the Government steelworks at Zenica, north-west of Sarajevo, have combined to induce the Government to undertake the opening up of the greater part of this area with an important standard gauge system of lines. This consists of a long west-to-east line from Banja Luka to Kraljevo, intersected at Doboj by a north-south 4 ft. 8½ in. line from Brod to Sarajevo, the whole probably comprising some 375 route miles of line.

The Banja Luka—Kraljevo Line

Banja Luka is the present terminus of the existing Sunja—Bos Novi —Prijedor—Banja Luka standard gauge line, and the extension from it, eastwards, will first of all open up new country to Pribinic, whence it will replace the 2 ft. 6 in. gauge privately-owned line to Usora and Doboj. Construction of the Banja Luka—Doboj section has already been taken in hand. From Doboj, the existing State 2 ft. 6 in. gauge alignment to Tuzla and Simin Han will be more or less closely followed, the narrow gauge line being dismantled when the standard gauge is opened. The next section to the Drina valley will be costly to construct, and will entail considerable tunnelling and heavy grades. The Drina will be crossed at the health resort, Koviljaca, and a short length of private 2 ft. 6 in. gauge railway will be followed thence to Loznica, but new country will again be traversed along the Jadar valley to Valjevo. There is yet another 2 ft. 6 in. line from Valjevo to Lajkovac, where the main line of that gauge from Belgrade to Sarajevo and Kraljevo is joined, but the narrow gauge route is roundabout, and in any case it is important and will have to remain, irrespective of the new standard gauge line. The last section of the latter will therefore follow an independent and shorter route to Cacak, whence it will parallel the narrow gauge line to Kraljevo. The Cacak—Kraljevo section is in easy country and construction is already nearly completed, but the narrow gauge, as part of a through route via Stalac to Prahovo on the Danube, will also be retained.

Brod—Doboj—Sarajevo Line

Between Brod and Doboj the new standard gauge line will run to the east of the Ljupljanica heights and not follow the existing 2 ft. 6 in. gauge line to the west, which, with its extension from Doboj to Zenica, will be dismantled when the new standard gauge line is finished. The latter will closely follow the narrow gauge alignment, and from Zenica to Sarajevo it will run parallel to the 2 ft. 6 in. gauge line, which will be retained as it is of considerable mineral importance in feeding Zenica with iron ore from Vares, and is also part of the Sarajevo, Lasva, Travnik, Bugojno and Jajce system. Owing to the sharp curvature of these various narrow gauge sections of line, the new standard gauge alignment will follow the former only in the general sense of the term.



Map of Jugoslavia showing the lines completed since the war as referred to in our editorial on page 793, and the new lines now under construction or proposed

CANADA

T. & N.O. Earnings

The financial results of the Temiskaming & Northern Ontario Railway, owned by the province of Ontario, were presented recently to the Ontario Government. For the year ended March 31, 1936 the net earnings were $792,012, an increase of 204 per cent. over the previous year's figure. The revenue increased by 7·6 per cent. while the operating expenditure was reduced by 4·5 per cent. Within the railway area lumbering, agriculture, and gold mining are continuing to show more activity.

New Railway and the Legislature

The Railway Committee of the Legislature debated and finally adopted a Bill granting a charter to the Quebec Goldfields Transport Company to construct a line of railway 250 miles in

length, to link the northern mining area in Quebec Province with existing railways in the south. Amendments embodied stipulated that work must begin from Mont Laurier and Maniwaki in the south within one year's time and proceed northwards, and be completed within five years. The Bill suggested 30,000 shares each with a nominal value of $25. Mont Laurier and Maniwaki are railheads of C.P.R. branch lines taking off that system from near Montreal and Ottawa respectively, and running northwestwards towards undeveloped territory between the C.P.R. system and the C.N.R. Transcontinental line. The Bill is the next to come before the Legislature.

New C.N.R. Mining Area Line

The Canadian National Railways are building a 100-mile line to give direct communication between Montreal and Quebec on one hand and the gold mining region round Val d'Or on the other. The line is to be opened in the autumn.

CHINA

New Rolling Stock for Hwainan Railway

The Hwainan Railway traffic is increasing so rapidly that there is now a shortage of rolling stock, and consequently the administration has placed orders in Czechoslovakia for eight new locomotives and 300 wagons.

Paochi-Chengtu Railway

A materials loan amounting to $50,000,000 for the construction of this line is being negotiated between the Ministry of Railways and the Belgian Compagne Générale de Chemin de Fer et de Tramways en Chine. A formal contract is expected to be signed by the parties shortly. The survey for this line is now well in hand, and construction will probably take about 2½ years to complete. The new line will form an extension of the Lung-Hai Railway, with which this Belgian syndicate is already closely associated financially, and most of the equipment is Belgian.

Centralisation of Workshops

The Ministry of Railways is getting out plans for the erection of central railway workshops to meet the needs of the various lines. The initial cost of the plant will be $10,000,000 of which half will be subscribed by private firms and half by the Ministry so that the shops will be a joint enterprise. Arrangements have been made for the Ministry of Industry's central ironworks at Shanghai to be transferred to the Ministry of Railways. It is the intention eventually to build locomotives, carriages and wagons in the central workshops and to produce rails, sleepers, crossings, fishplates and other incidental requirements. The new establishment will be administered by a joint board under the chairmanship of the Minister of Railways. As a commencement the workshops of the Canton-Hankow Railway at Chuchow, the Nanking-Shanghai Railway at Woosung, the Shanghai-Hangchow-Ningpo Railway at Zahkou and Tientsin-Pukow Railway shops will be taken over by the new organisation, the individual railways carrying out only minor running repairs. It is considered that a great saving will be effected both in the cost of plant and machine tools and in the standardising of certain equipment, avoiding the necessity of stocking so many different types of spare parts, as well as securing economy in administration.

New Lines Projected in South China

The Kwangtung Provincial Government is understood to be arranging to issue bonds to the value of $25,000,000 to finance the construction of a new railway from Canton to Meihsien; it will be some 350 km. in length and will tap some of the richest areas in south-eastern Kwangtung.

A new line to connect Kwangsi and Hunan Provinces is to be built at a cost of $36,000,000, to be shared equally by the two Provinces (each subscribing $9,000,000) and by the Ministry of Railways in Nanking.

Miscellaneous News

It has been agreed between the Provincial authorities and the Chengtu-Chungking Railway representatives that work on the line shall begin on May 1.

The Chientang River Bridge will be completed in the autumn and it is hoped to formally open the new structure on October 10—the "Double Tenth" — simultaneously with the opening of the Tsaongo-Hangchow section of the Shanghai—Hangchow-Ningpo Railway now under construction.

DENMARK

Purchase of Swedish State Railways Pacific Locomotives

The Danish State Railways have recently acquired the 11 Pacific express locomotives of the Swedish State Railways at an exceedingly favourable price. These locomotives, which were built in Sweden in 1914-16, and have been displaced by electrification, are four-cylinder compounds with the following leading dimensions:—

Coupled wheels diam. ...	6 ft. 2 in.
Cylinders, h.p.	16½ in. × 26 in.
,, l.p.	25 in. × 26 in.
Boiler pressure	185 lb. per sq. in.
Heating surface... ...	2,660 sq. ft.
Grate area	39 sq. ft.
Weight, adhesion ...	50·3 English tons.
,, total engine and tender ...	135 ,, ,,
Tender capacity—	
Water	5,500 gal.
Coal	6·4 tons.

After arrival in Denmark various minor alterations to these locomotives will be necessary, such as changing them from left-hand to right-hand driving, fitting them with vacuum brakes in addition to their present air brakes and rearrangement of the springing to increase the adhesion weight. The transfer from Swedish to Danish metals will take place via the Hälsingborg-Elsinore train ferry. It has been necessary to replace the drawbridge of the Elsinore ferry terminal by one of stronger construction to carry these heavy loads, but this replacement was due in any case. It is proposed to employ the Pacifics on the Copenhagen—Gedser and Nyborg—Aarhus routes (via the Storstrøm and Little Belt bridges, respectively). They will be the first Pacifics to appear in Denmark, and they will also be the largest and heaviest locomotives in the country.

SWEDEN

Bergslagernas Finances in 1936

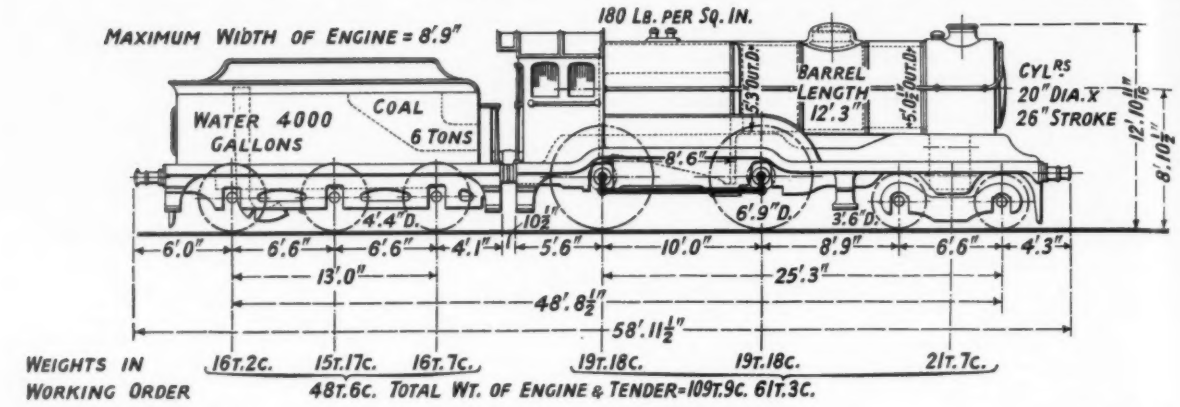
The Bergslagerna Railway, the largest privately-owned railway system in the country, together with its allied lines reports total revenues of 28·7 million kronor for the past year against 26·9 millions for 1935. The net profit after writing-off and reservations was 2·66 million kr. (£146,300 at par) against 2·06 millions for the preceding year. A sum of 5·2 million kr. is available for distribution, and the board proposes an unchanged dividend of 4 per cent., and the transfer of 2·5 millions to the Disposal Fund and 1·67 millions to this year's Profit and Loss Account. During the past year the number of passengers carried rose by 4·3 per cent. and the income from passengers by 6·2 per cent. The lines of this railway company are some of the most popular and picturesque tourist routes across Central Sweden, covering the well-known provinces of Vermland and Dalecarlia.

SPAIN

The Norte

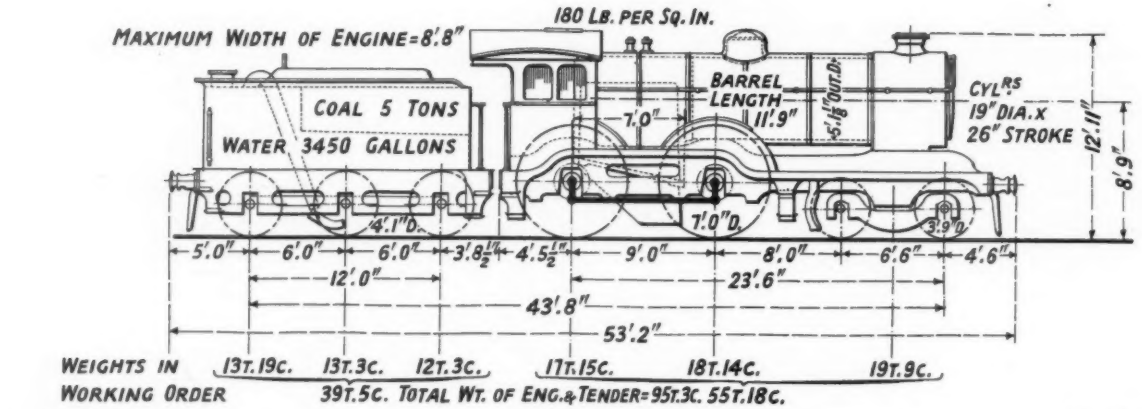
The Northern Railway station at Madrid, which, as previously pointed out, is and has been situated, in the forefront of military operations, has suffered more, perhaps, than any other single point. It was the first objective of the insurgents' drive in November last and since then has been shelled and bombed incessantly. The station now presents a sorry spectacle, the tracks and platforms encumbered with shapeless heaps of damaged vehicles, forming what is little more than an immense scrap heap. The fine new station building, which was opened to service a year or two ago, is now a ruin, a dilapidated skeleton, with only the bare walls standing and the gaunt framework of the platform roof. Outside the station and along the main line towards Las Rozas the track has been used for purposes of defence and the front line system of the trenches of the West Park reaches down to the rails and crosses them in parts down to the main road and the river. Right up to Escorial the railway winds in and out of "no man's land" and as regards the state of the mountain section beyond and through the Guadarrama no reliable information is at present available.

British Locomotive Types—X



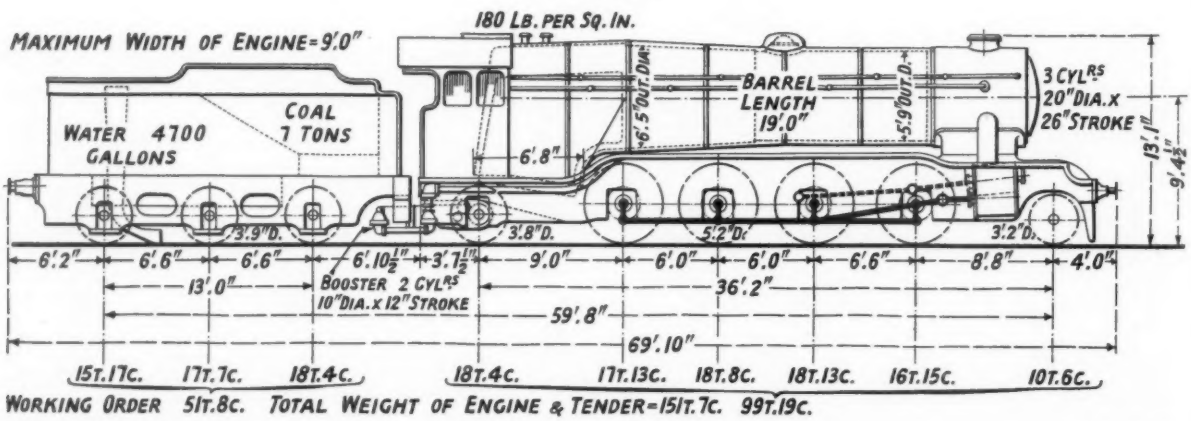
HEATING SURFACE, TUBES—		SUPERHEATER	209·0 SQ. FT.
LARGE AND SMALL	1,388·0 SQ. FT.	COMBINED HEATING SURFACES	1,752·0 ,,
FIREBOX	155·0 ,,	GRATE AREA	26·5 ,,
TOTAL (EVAPORATIVE)	1,543·0 ,,	TRACTIVE EFFORT (AT 85 PER CENT. B.P.)	19,644 LB.

D. 11 *Class*



HEATING SURFACE, TUBES—		SUPERHEATER	204·4 SQ. FT.
LARGE AND SMALL	1,303·4 SQ. FT.	COMBINED HEATING SURFACES	1,633·8 ,,
FIREBOX	126·0 ,,	GRATE AREA	21·4 ,,
TOTAL (EVAPORATIVE)	1,429·4 ,,	TRACTIVE EFFORT (AT 85 PER CENT. B.P.)	17,096 LB.

D. 16 *Class*

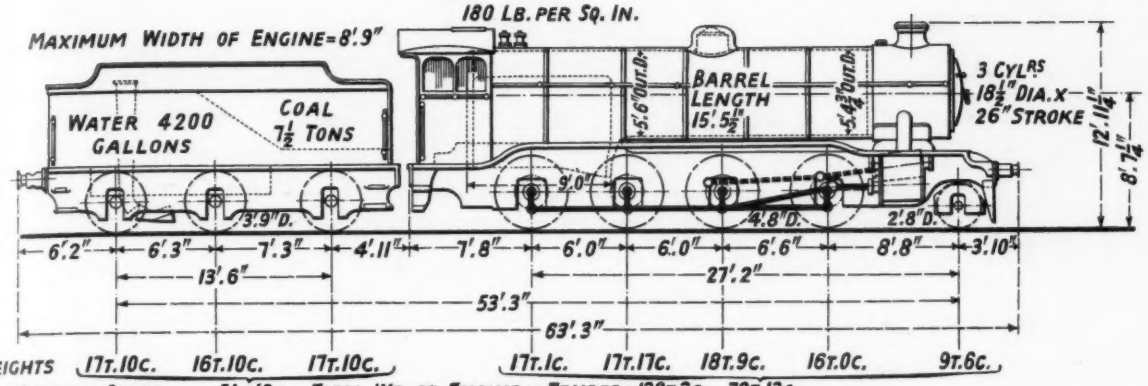


HEATING SURFACE, TUBES—		SUPERHEATER	525·0 SQ. FT.
LARGE AND SMALL	2,715·0 SQ. FT.	COMBINED HEATING SURFACES	3,455·0 ,,
FIREBOX	215·0 ,,	GRATE AREA	41·25 ,,
TOTAL (EVAPORATIVE)	2,930·0 ,,	TRACTIVE EFFORT (AT 85 PER CENT. B.P.)	38,500 LB.*

* With booster in action tractive effort is increased to 47,000 lb.

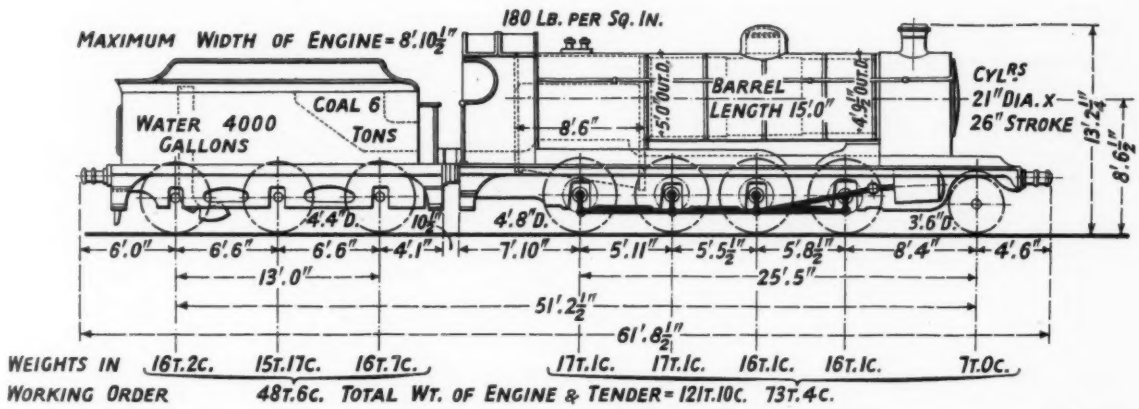
P. 1 *Class*

London & North Eastern Railway



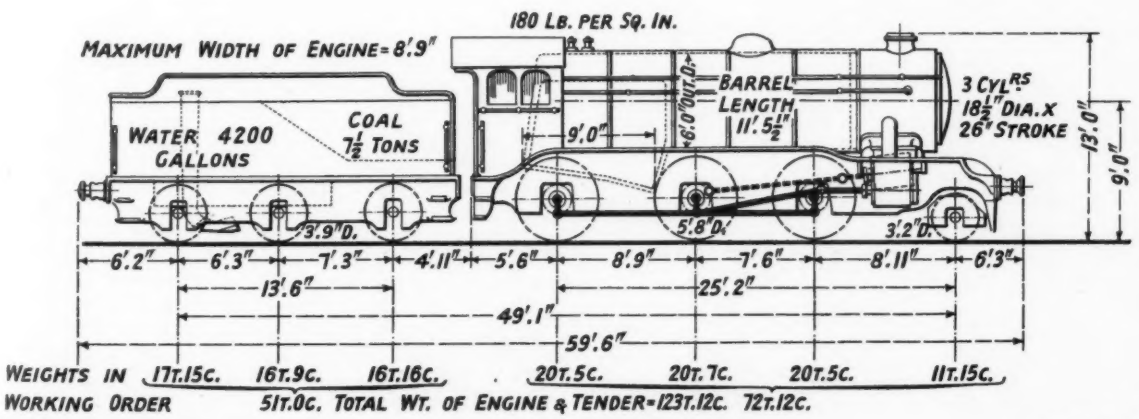
HEATING SURFACE, TUBES—		SUPERHEATER	430·5 SQ. FT.
LARGE AND SMALL	1,868·5 SQ. FT.	COMBINED HEATING SURFACES	2,462·5 ,,
FIREBOX	163·5 ,,	GRATE AREA	27·5 ,,
TOTAL (EVAPORATIVE)	2,032·0 ,,	TRACTIVE EFFORT (AT 85 PER CENT. B.P.)	36,470 LB.

O. 2 Class



HEATING SURFACE, TUBES—		SUPERHEATER	242·0 SQ. FT.
LARGE AND SMALL	1,349·0 SQ. FT.	COMBINED HEATING SURFACES	1,745·0 ,,
FIREBOX	154·0 ,,	GRATE AREA	26·24 ,,
TOTAL (EVAPORATIVE)	1,503·0 ,,	TRACTIVE EFFORT (AT 85 PER CENT. B.P.)	31,326 LB.

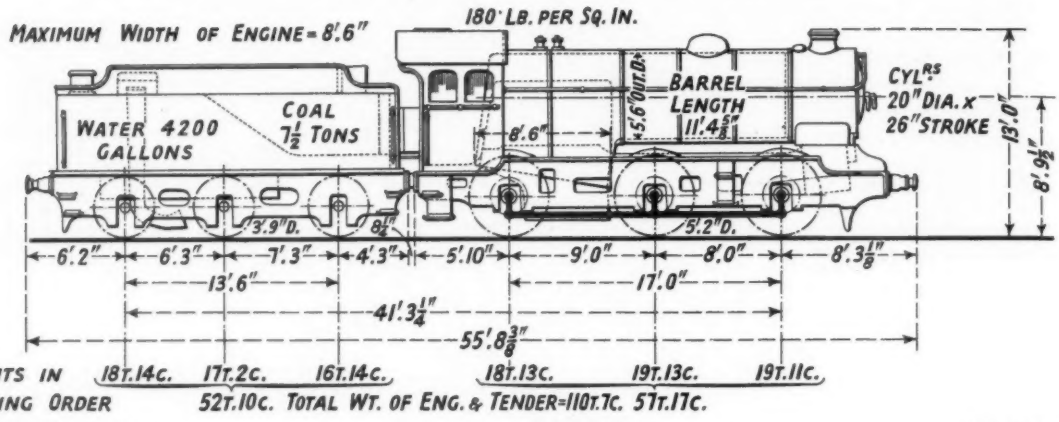
O. 4 Class



HEATING SURFACE, TUBES—		SUPERHEATER	407·0 SQ. FT.
LARGE AND SMALL	1719·0 SQ. FT.	COMBINED HEATING SURFACES	2,308·0 ,,
FIREBOX	182·0 ,,	GRATE AREA	28·0 ,,
TOTAL (EVAPORATIVE)	1,901·0 ,,	TRACTIVE EFFORT (AT 85 PER CENT. B.P.)	30,031 LB.

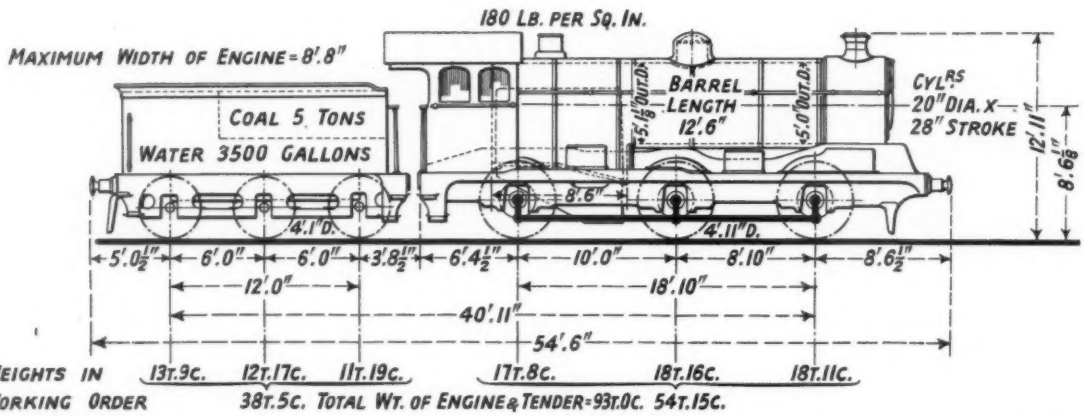
K. 3 Class

British Locomotive Types—X. L.N.E.R.—*continued.*



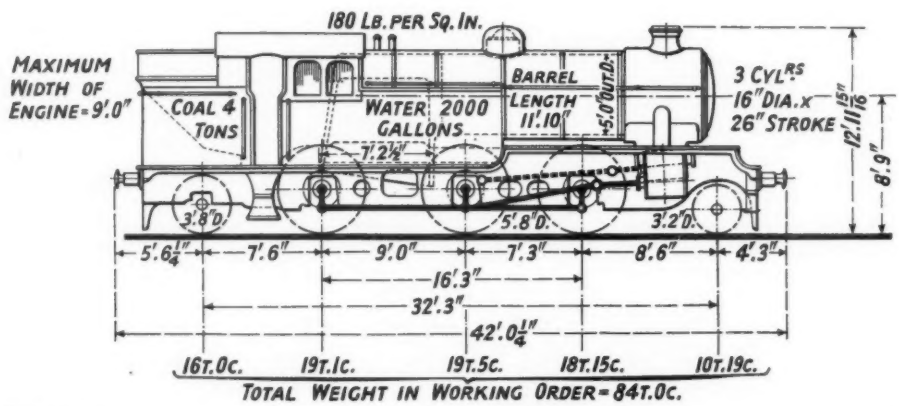
HEATING SURFACE, TUBES—		SUPERHEATER	271·8 SQ. FT.
LARGE AND SMALL	1,226·28 SQ. FT.	COMBINED HEATING SURFACES	1,669·58 ,,
FIREBOX	171·5 ,,	GRATE AREA	26·0 ,,
TOTAL (EVAPORATIVE)	1,397·78 ,,	TRACTIVE EFFORT (AT 85 PER CENT. B.P.)	25,664·0 LB.

J. 39 *Class*



HEATING SURFACE, TUBES—		SUPERHEATER	201·6 SQ. FT.
LARGE AND SMALL	1,465·6 SQ. FT.	COMBINED HEATING SURFACES	1,810·7 ,,
FIREBOX	143·5 ,,	GRATE AREA	26·5 ,,
TOTAL (EVAPORATIVE)	1,609·1 ,,	TRACTIVE EFFORT (AT 85 PER CENT. B.P.)	29,044·0 LB.

J. 20 *Class*



HEATING SURFACE, TUBES—		SUPERHEATER	284·0 SQ. FT.
LARGE AND SMALL	1,198·0 SQ. FT.	COMBINED HEATING SURFACES	1,609·0 ,,
FIREBOX	127·0 ,,	GRATE AREA	22·08 ,,
TOTAL (EVAPORATIVE)	1,325·0 ,,	TRACTIVE EFFORT (AT 85 PER CENT. B.P.)	22,464·0 LB.

V. 1 *Class*

REORGANISATION OF THE MOTIVE POWER DEPARTMENT OF THE L.M.S.R.—II

The first instalment of this article outlined the principles on which the L.M.S.R. planned this noteworthy scheme. Details are now given of the examination and repair system, method of dealing with engine casualties, and other matters

TO facilitate examination and repair work, the main depots have been equipped with suitable machinery, and the repair staff augmented where required by the transfer of men from the sub-depots. Engines are worked to the main depot from the respective sub-depots in the area, and so scheduled that they can be taken in hand by the repair staff immediately on arrival, thus avoiding waiting time and ensuring continuous and effective employment of staff. One of the advantages of this system is that it enables repairs to be carried out continuously through the 24 hours if necessary, and permits of particular classes of work being allocated to specified men; this results in an efficient repair being carried out in the minimum of time, permitting engines to be returned to traffic earlier, with a consequent increase in availability.

The sub-depots are essentially to be regarded as "garages," and only minor examinations and running repairs are effected there during stoppages not exceeding twenty-four hours, in accordance with the "Locomotive Maintenance and Mechanical Efficiency Schemes" or as it is more familiarly known on the L.M.S.R. the "X" scheme. The objects of this scheme are: (1) The prevention of the development of defects in locomotives and the maintenance of a high standard of mechanical efficiency, by carrying out thorough and detailed examination and repairs at predetermined periods; (2) To increase the availability of locomotives for the operating section; and (3) To eliminate repetition repairs. As will readily be appreciated, it is possible by synchronising the minor examinations and repairs with the washing-out operation when the steam is blown out of the boiler, to carry out more efficiently the examination and repairs, for the reason that all steam jobs can be undertaken more comfortably and with greater efficiency by the repair staff, and similarly, the cleaning of the firebox and tube ends can be performed more satisfactorily. The ideal and aim is to run the locomotive for a predetermined period without any repairs being necessary.

The advantage of this system is that a considerable saving in engine units is achieved by the pooling of spare power at the main depots. Formerly it was necessary for spare engines to be provided at many of the garage depots to cover each class, and allow not only for specials and day-to-day requirements, but also the period of shopping and heavy shed repairs. The movement of engines between the main and garage depots is made in most cases without incurring light mileage by utilising the ordinary services. The closest co-operation exists between the district locomotive superintendent and the district traffic controller, and no engines are turned off the locomotive yard without agreement with the control section.

The particular portion of the main depot set aside for carrying out organised repairs is very carefully laid out to eliminate unnecessary manual movements, this being done by allocating particular pits to such special work as (1) boiler cleaning; (2) valve and piston mileage examinations; (3) concentration repairs; and (4) washing out and "X" repairs. By this means the work can be brought to the man instead of *vice versa*, and this not only concentrates the work at one depot but literally concentrates the repairs in one part of the shed. Heavy parts such as brake blocks, firebars, firebricks, tubes, &c., are located adjacent to the respective pits where the work is performed, and the method of working makes possible a much improved supervision of all activities.

"Casualties"

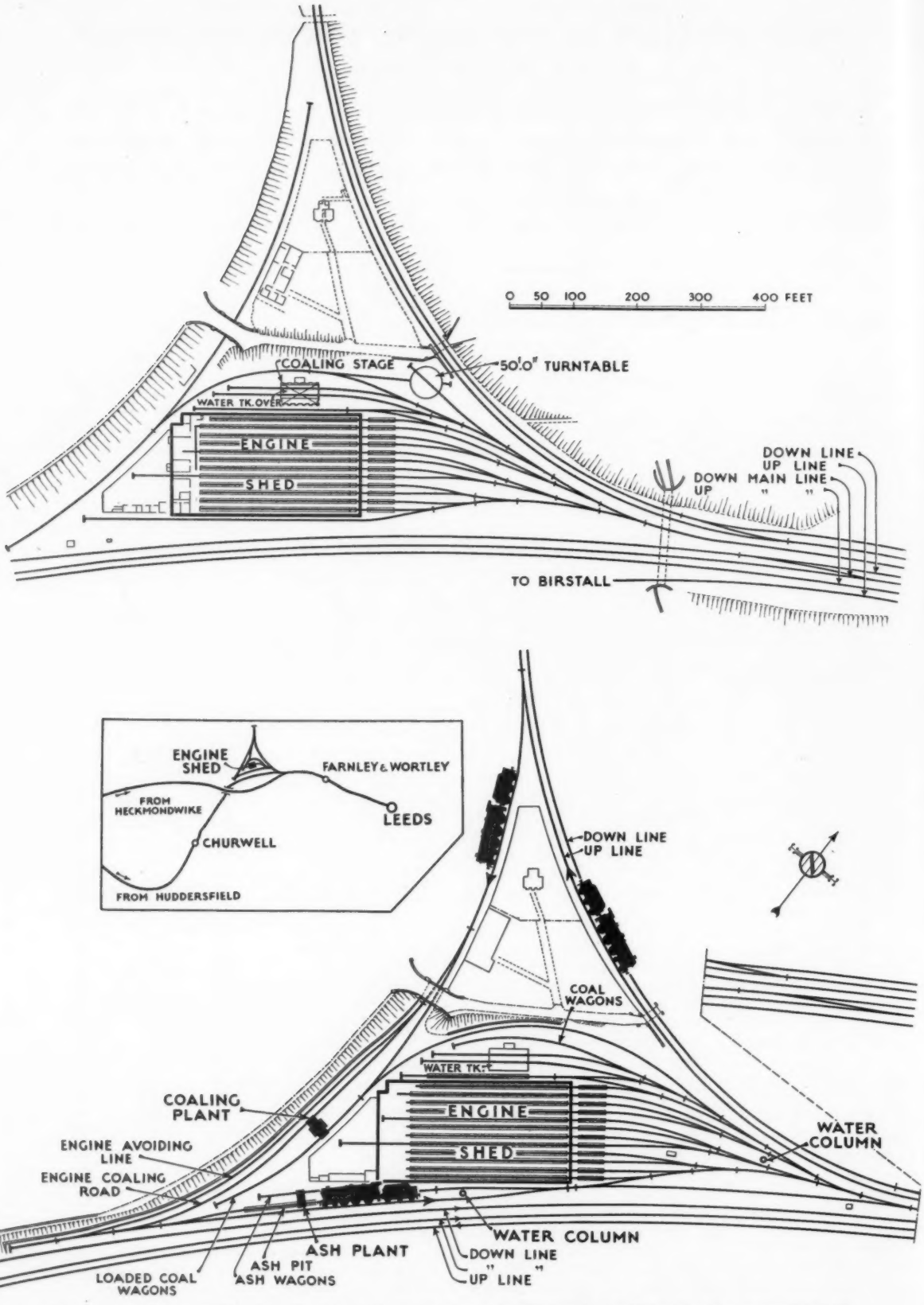
Locomotive casualties are a source of trouble both to the Motive Power Section and the Operating Department, particularly in their effects on other trains. The reactions from a single casualty may extend over an area of 100 to 200 miles, with consequent detriment to punctual working, which, in turn, reacts adversely on trainmen's time reliefs and working expenses generally. While the "X" scheme previously referred to has played an important part in the reduction of casualties, it was considered that something more was required, namely, the enthusiasm and personal pride of the locomotive staff engaged in the work at the sheds.

In 1935 a Motive Power League was started with the object of creating an added interest amongst the staffs engaged in the management and maintenance of the company's locomotives, whilst at the disposal of the Operating Department as a means of reducing casualties, thus contributing to efficiency and punctual train working.

TYPICAL MOTIVE POWER LEAGUE RESULTS

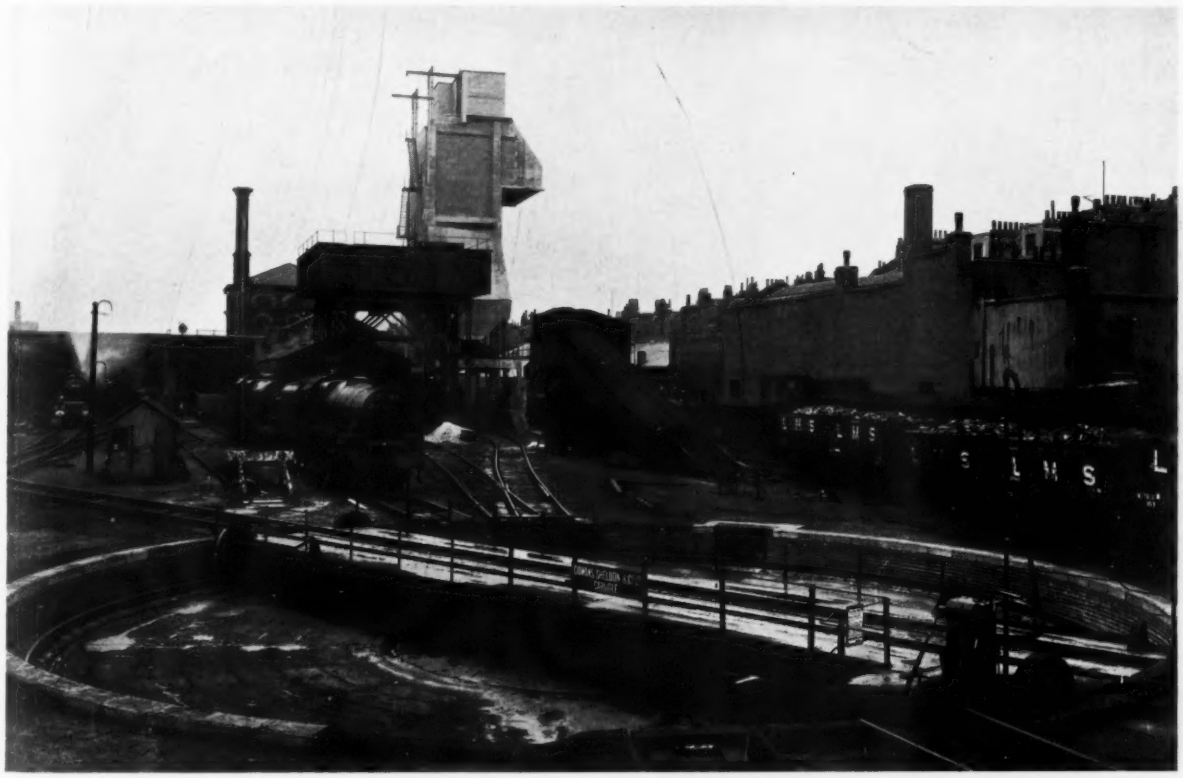
District	Points		Position	
	Four weeks ended Jan. 23, 1937	Total to date	Present	Previous
Plaistow	29	255	1	3
Bristol	27	254	2	2
Saltley	28	250	3	1
Wellingborough	24	231	4	4
Shrewsbury	25	212	5	6
Crewe	19	204	6	5
Edge Hill	21	187	7	8
Accrington	13	186	8	7
Derby	20	182	9	9
Llandudno Junction	26	169	10	10
Bescot	23	163	11	11
Nottingham	16	155	12	12
Motherwell	10	150	13	14
Wakefield	17	149	14	15
Longsight	22	149	15	16
Newton Heath	11	141	16	17
Cricklewood	7	134	17	13
Chester	15	128	18	23
Toton	12	126	19	18
Bank Hall	14	121	20	20
Sheffield	8	111	21	21
Perth	18	110	22	26
Springs Branch	2	108	23	19
Leeds	9	107	24	22
Polmadie	6	102	25	25
Carnforth	3	96	26	24
Willesden	5	63	27	27
Rugby	1	54	28	28
Carlisle	4	53	29	29

The league was organised for the whole of the line, comprising 29 motive power areas, thus bringing the staff into friendly rivalry on a competitive basis. The district which, during each four-weekly period, obtains the highest



Locomotive depot at Farnley (Leeds). Above, as formerly arranged; and below, after reorganisation

miles per engine casualty debitable to the owning shed is awarded 29 points, and that with the next highest 28 points, and so on in order of merit. The competitive element of the movement keeps the staff at the depots in the leading districts on their merit, and encourages the others to intensify their efforts. The result of this friendly competition has been very encouraging and once more emphasises the truth of the saying that "prevention is better than cure." The table shows the results for four weeks ending January 23 in the present year. It will be seen that the Plaistow shed at this period held the premier position, followed by Bristol and Saltley; the relative present and previous positions are shown in the two right-hand columns.



Camden locomotive depot from north end, showing 70-ft. vacuum-operated turntable in foreground

The number of casualties for the whole of the L.M.S.R. during the past three years has shown a substantial decrease, thus:—

	Decrease. Per cent.
1935 compared with 1934	19·5
1936 ,, 1935	15·0
1936 ,, 1934	31·5

Expressed in terms of additional miles run per casualty, the improvement is:—

	Per cent.	
1935 compared with 1934	25·7	In relation to mileage.
1936 ,, 1935	21·4	
1936 ,, 1934	52·6	

The L.M.S.R. formula for defining a casualty is very stringent, which further commends the results obtained.

Mechanical Coaling Plants, and Servicing of Engines at Depots

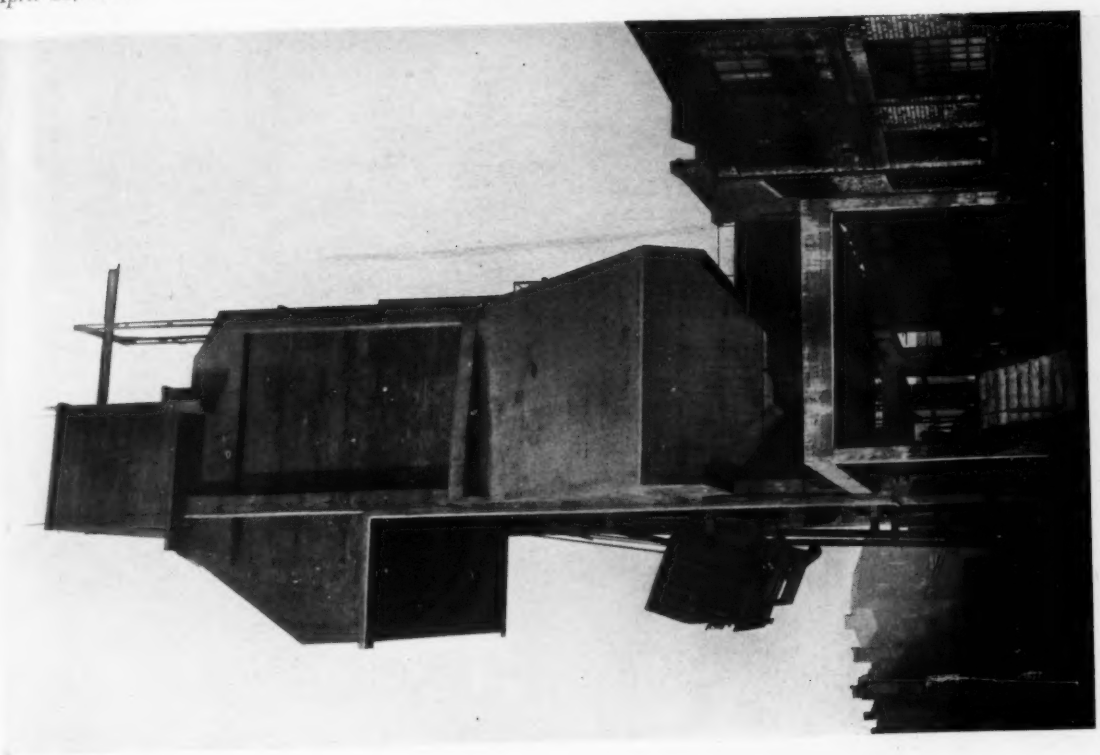
A time study of the conditions under which engines were being coaled at many depots disclosed that excessive times were absorbed for this purpose, often aggravated by congestion in the yard and at the coal stage during periods of stress. The installation of a mechanical coaling plant, enabling the actual coaling of an engine to be completed within five minutes, could not be fully justified unless means were also taken to ensure that engines passed to and from the plant without hindrance at any point during the day. The coaling of an engine is therefore merely one of the services to be performed, as the engine moves in progressive and orderly sequence from the shed yard entrance to the shed or preparation pit. The layout of the yard must be such that no conflicting movements arise between outgoing and incoming engines; ample acceptance room must also be provided during the various stages of disposal to prevent blocking back. The sequence of disposal operations is in accordance with the principles already stated, viz.:—

(1) Coaling.
(2) Watering.
(3) Ashpit: cleaning fires, ashpans, and smokeboxes.
(4) Turning.
(5) Stabling in shed, or return to preparation pits for further duty.

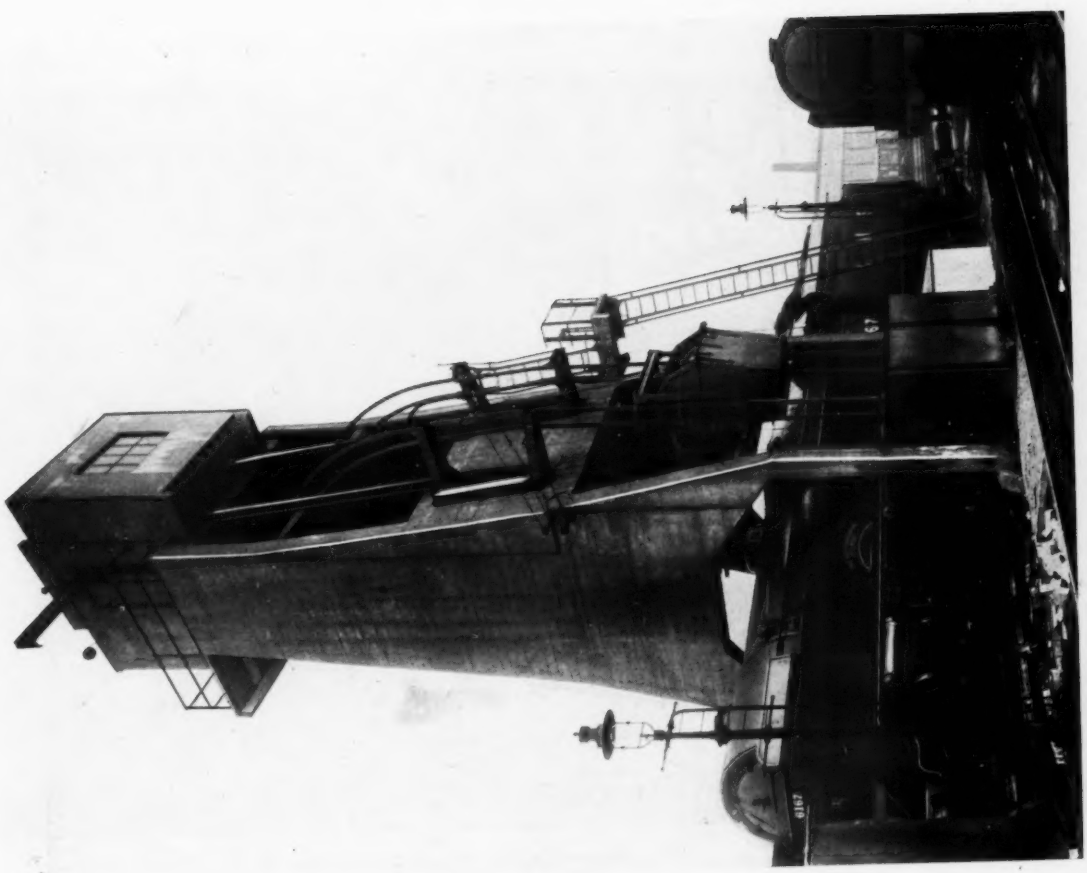
Avoidance roads are also provided for "turn-back" engines, or engines which are not required to go through the full sequence. It will be realised that the extent to which these ideals can be attained will be governed by site limitations, and illustrations of typical yard layouts as they have been planned at Camden (London), Longsight (Manchester), Farnley (Leeds), and Derby, are shown.

Before proceeding to a further consideration of the general principles of the scheme, some details of the layouts at these points, both before and after modernisation, will be of interest. The illustrations indicate, by means of small locomotive profiles, the progressive movements made

General view of Camden locomotive depot from south end. Ash plant in foreground, with coaling plant beyond. Main lines Euston to the north on the right



Coaling plant at Camden depot

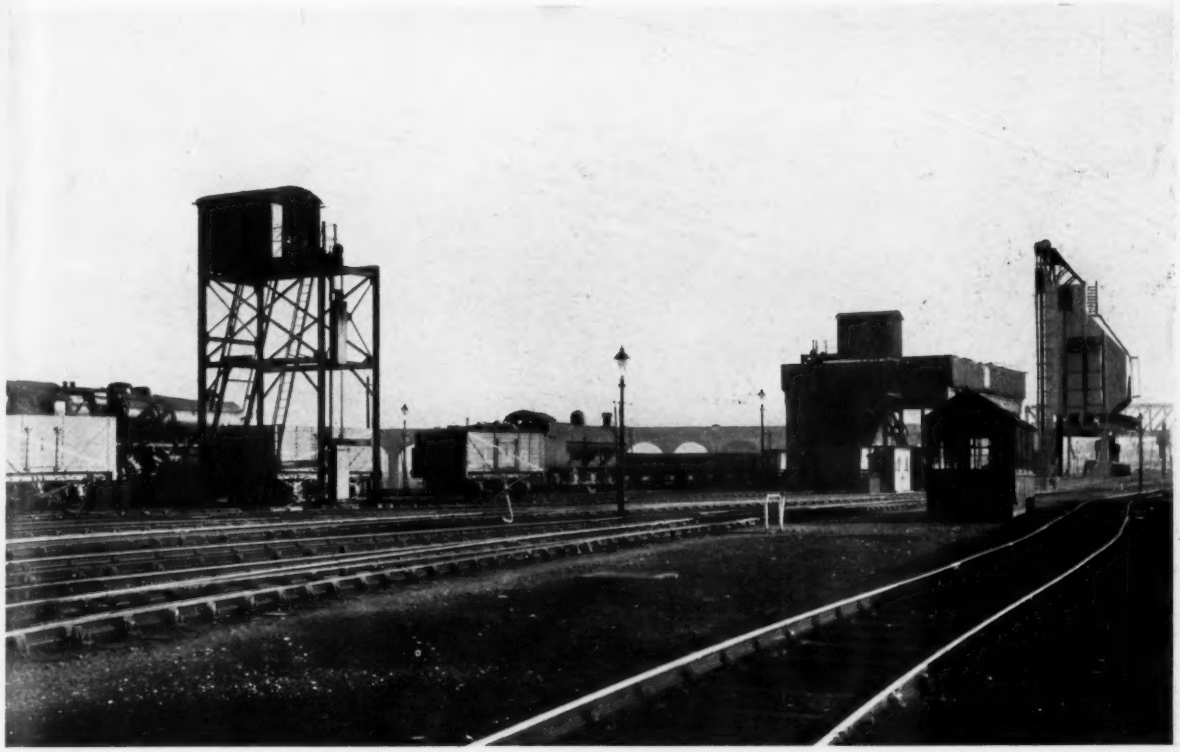


Ash plant at Camden depot

General view of Camden locomotive depot from south end. Ash plant in foreground, with coaling plant beyond. Main lines Euston to the north on the right

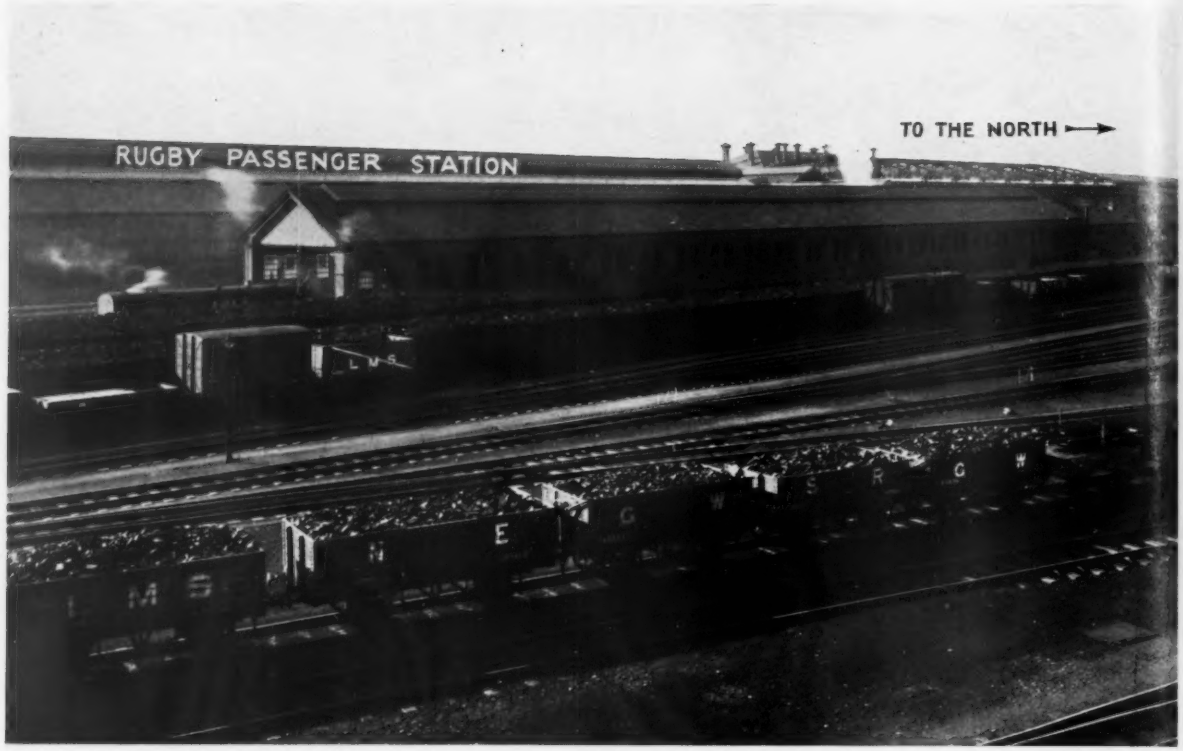
Interior of locomotive running shed at Camden, L.M.S.R. Note orderly condition of shed

Interior of examination and repair shed at Camden locomotive depot

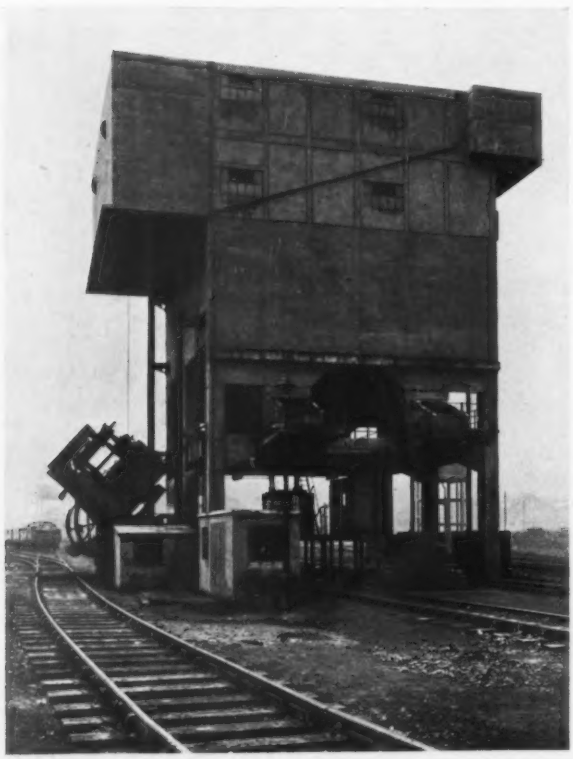


Rugby locomotive yard looking towards London. Coaling plant in distance

Disposal of ashes from smokebox and firebox of locomotive at Camden depot. Narrow gauge trolleys in pit and alongside



L.M.S. Rugby passenger station and part of locomotive yard and tracks giving access to and from the depots

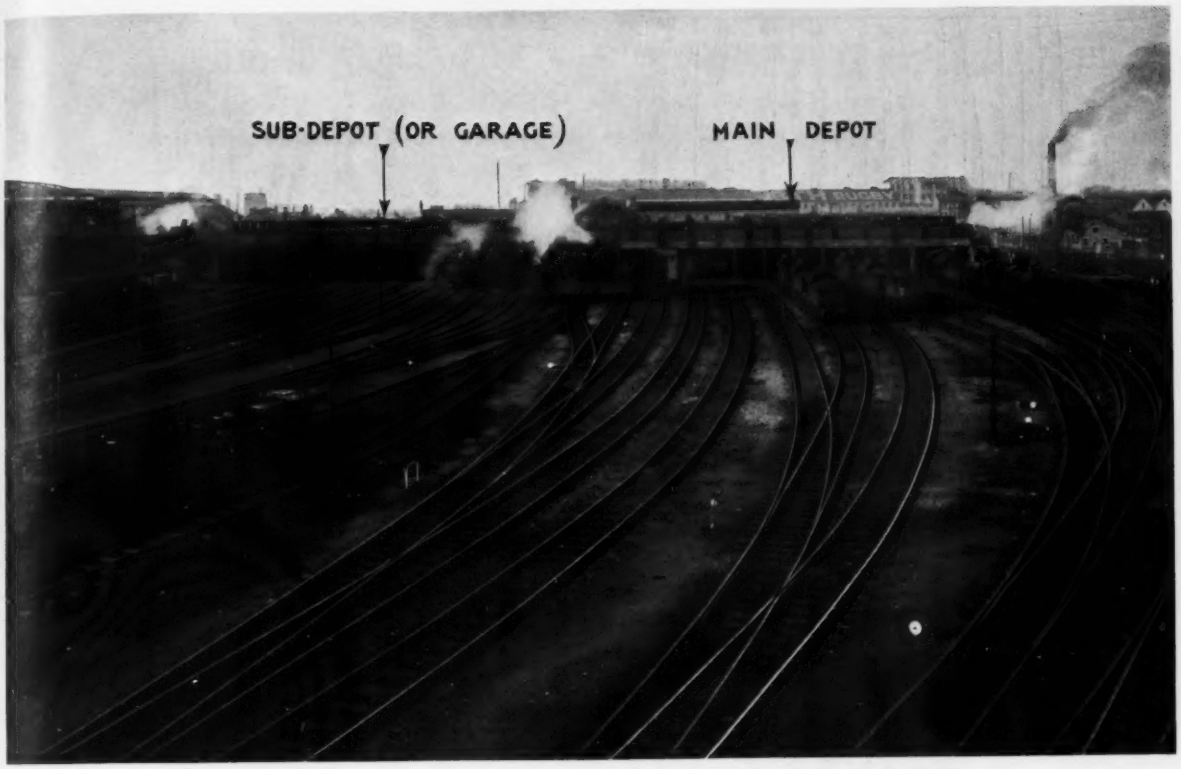


Derby coaling plant from south, showing wagon tipped. No. 1 size plant, with two 150-ton bunkers

by engines as they pass through the modernised yards. In the case of Farnley Junction, the drawings on page 804 show the layout before and after modernisation, but in the case of Camden, Longsight and Derby the lay-out of the yards as they previously were, is indicated only by dotted lines, new work in red and undisturbed original work is in solid black lines. At Camden, engines coming on the shed from the Euston or south end of the yard proceed along the road adjacent to the shed, indicated as explained, to the turntable; from thence to the coal plant, then to the ashpits, and from there through the points at the south end of the yard and back to the preparation pits or into the shed. Engines proceed to Euston from the south end of the shed.

The sequence of movements at Longsight is clearly indicated by the folding plate. Engines enter this shed either by the south or north ends and pass through the coaling plant, ashpits, and on to the south end of the shed. Preparation pits are provided at either end of the shed for engines going on to the south or north lines.

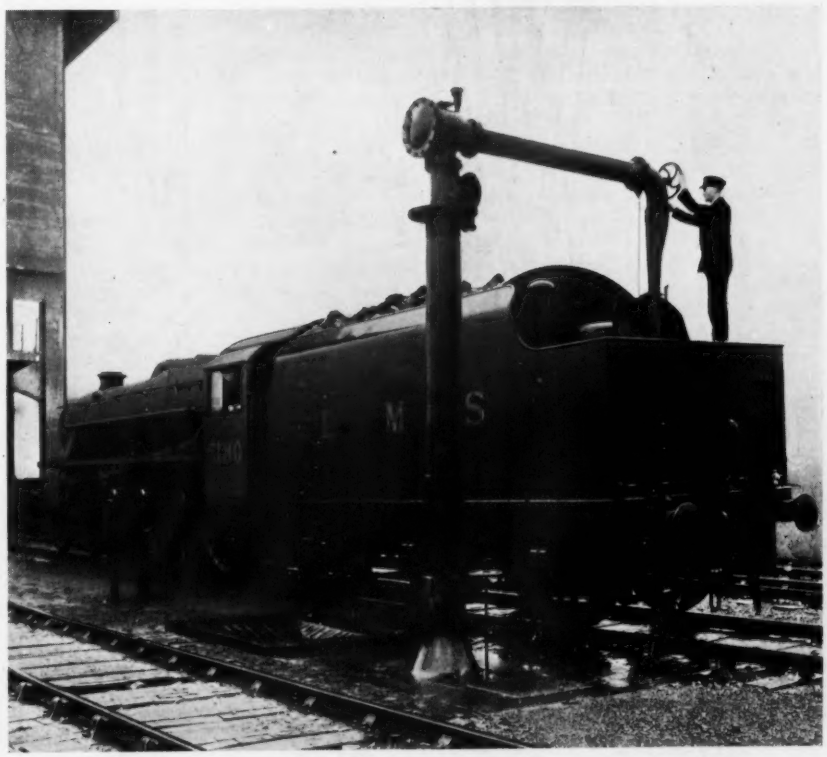
In the arrangement at Farnley Junction as it was before modernisation, engines entered the shed yard and proceeded to the turntable; after turning they moved to the entrance of the yard by the same road to enable them to get to the coaling stage. The same objectionable double-back movements had to be repeated in order to gain access to the ashpit, situated on the road adjacent to the engine shed, for fire cleaning purposes. When these operations had been completed, the engine had to return to the neck of the yard again before proceeding to the shed road on which it had to be stabled. These operations involved many conflicting movements and delays, particularly at busy periods, leading to serious congestion and inability to get power when it was most urgently required. The drawing shows how these objectionable features have been overcome. The turntable has been



General view of locomotive yard at Rugby with main and sub-depots in line

removed, and the uncompleted part of the triangle at the shed joined up so that engines coming on the shed for coaling purposes or disposal move in the direction indicated by the engine profiles on the drawing, through the coaling plant on to the ash plant and back into the running shed in orderly sequence of movement.

At the Derby depot engines arrive and leave at either end of the yard and move progressively as shown on the plate. Ample accommodation for freight engine storage is provided by sidings north of the running shed, to which engines may pass direct after leaving the ash plant as indicated by the arrows, or into the running shed if they require attention. Passenger engines pass into the running shed either by the centre road as indicated, or across the new 70-ft. turntable at the south end of the shed. Ample outside stabling accommodation is provided for engines not requiring attention, or duties which are better performed under cover. A study of the plan will show the admirable manner in which this busy and important depot has been laid out to give elasticity of movement and freedom from congestion.



New type water crane at Derby. Water supply controlled at tender level

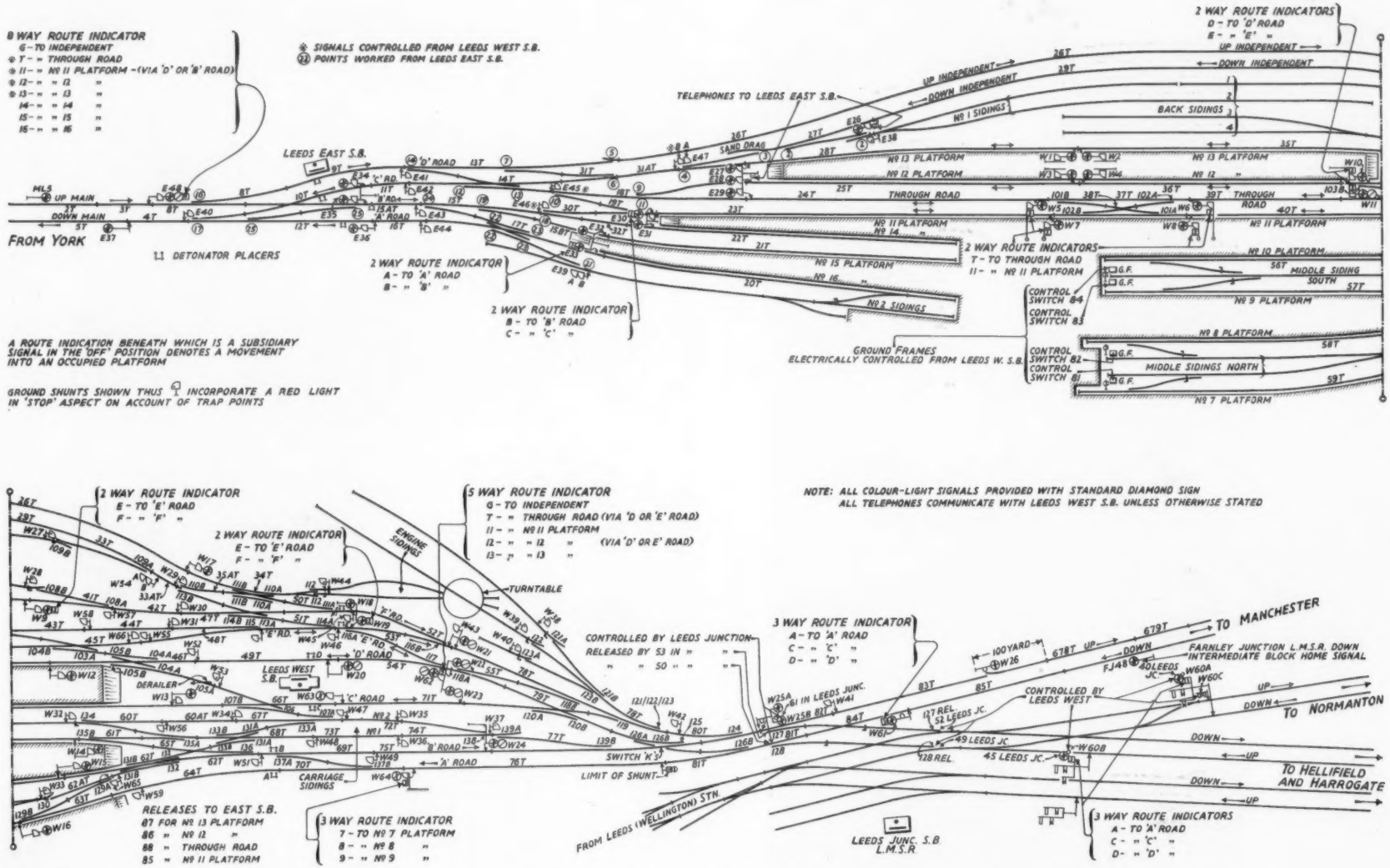

8 WAY ROUTE INDICATOR
G – TO INDEPENDENT
* T – " THROUGH ROAD
* 11 – " № 11 PLATFORM – (VIA 'D' OR 'B' ROAD)
* 12 – " " 12 "
* 13 – " " 13 "
14 – " " 14 "
15 – " " 15 "
16 – " " 16 "
* SIGNALS CONTROLLED FROM LEEDS WEST S.B.
(23) POINTS WORKED FROM LEEDS EAST S.B.
2 WAY ROUTE INDICATORS
D – TO 'D' ROAD
E – " 'E' "
TELEPHONES TO LEEDS EAST S.B.
LEEDS EAST S.B.
FROM YORK
UP MAIN
DOWN MAIN
'D' ROAD
'C' RD.
'B' RD.
'A' ROAD
SAND DRAG
UP INDEPENDENT
DOWN INDEPENDENT
№ 1 SIDINGS
BACK SIDINGS
№ 13 PLATFORM
№ 12 PLATFORM
THROUGH ROAD
№ 11 PLATFORM
№ 14 "
№ 15 PLATFORM
№ 16 "
№ 2 SIDINGS
№ 10 PLATFORM
MIDDLE SIDING SOUTH
№ 9 PLATFORM
№ 8 PLATFORM
MIDDLE SIDINGS NORTH
№ 7 PLATFORM
11 DETONATOR PLACERS
2 WAY ROUTE INDICATOR
A – TO 'A' ROAD
B – " 'B' "
2 WAY ROUTE INDICATOR
B – TO 'B' ROAD
C – " 'C' "
2 WAY ROUTE INDICATORS
T – TO THROUGH ROAD
11 – " № 11 PLATFORM
CONTROL SWITCH 84
CONTROL SWITCH 83
CONTROL SWITCH 82
CONTROL SWITCH 81
GROUND FRAMES
ELECTRICALLY CONTROLLED FROM LEEDS W. S.B.
A ROUTE INDICATION BENEATH WHICH IS A SUBSIDIARY SIGNAL IN THE 'OFF' POSITION DENOTES A MOVEMENT INTO AN OCCUPIED PLATFORM
GROUND SHUNTS SHOWN THUS INCORPORATE A RED LIGHT IN 'STOP' ASPECT ON ACCOUNT OF TRAP POINTS
2 WAY ROUTE INDICATOR
E – TO 'E' ROAD
F – " 'F' "
2 WAY ROUTE INDICATOR
E – TO 'E' ROAD
F – " 'F' "
5 WAY ROUTE INDICATOR
G – TO INDEPENDENT
T – " THROUGH ROAD (VIA 'D' OR 'E' ROAD)
11 – " № 11 PLATFORM
12 – " " 12 " (VIA 'D' OR E' ROAD)
13 – " " 13 "
ENGINE SIDINGS
TURNTABLE
NOTE: ALL COLOUR-LIGHT SIGNALS PROVIDED WITH STANDARD DIAMOND SIGN
ALL TELEPHONES COMMUNICATE WITH LEEDS WEST S.B. UNLESS OTHERWISE STATED
CONTROLLED BY LEEDS JUNCTION
RELEASED BY 53 IN " "
" " 50 " "
3 WAY ROUTE INDICATOR
A – TO 'A' ROAD
C – " 'C' "
D – " 'D' "
TO MANCHESTER
FARNLEY JUNCTION L.M.S.R. DOWN INTERMEDIATE BLOCK HOME SIGNAL
CONTROLLED BY LEEDS WEST
TO NORMANTON
TO HELLIFIELD AND HARROGATE
LEEDS WEST S.B.
DERAILER
'C' ROAD
'D' ROAD
'E' RD.
CARRIAGE SIDINGS
SWITCH 'K 39'
LIMIT OF SHUNT
FROM LEEDS (WELLINGTON) STN.
LEEDS JUNC. S.B. L.M.S.R.
RELEASES TO EAST S.B.
87 FOR № 13 PLATFORM
86 " № 12 "
85 " THROUGH ROAD
84 " № 11 PLATFORM
3 WAY ROUTE INDICATOR
7 – TO № 7 PLATFORM
8 – " № 8 "
9 – " № 9 "
3 WAY ROUTE INDICATORS
A – TO 'A' ROAD
C – " 'C' "
D – " 'D' "

Diagram of the general layout of the east and west ends of Leeds new station, showing the new signalling

RESIGNALLING OF LEEDS NEW STATION

Opening of new West signal box completes this important installation of relay interlocking carried out by the L.N.E.R.

ON Sunday, April 5, 1937, the resignalling of Leeds New station was completed by the bringing into service of the new West signal box. At the east end of the station the new signalling has been in use since June, 1936, and was described in our issue of July 3, page 14. In that case mechanical point operation was retained, the signals being controlled by thumb switches on a panel diagram over the ordinary levers; the old East signal box, which was 53 ft. long, has been shortened to 19 ft. and partly rebuilt.

The installation at the west end of the station is much larger and one new signal box takes the place of three old ones, Station, West and Canal, which together contained about 250 mechanical levers. This new installation is worked entirely by power, controlled from a panel diagram in a new signal box, with relay interlocking. This is the first time such interlocking has been applied to a large city station having considerable terminal traffic and which is, moreover, rather difficult to operate. The approach lines from the east, quadruple from Cross Gates where the Wetherby route comes in, are reduced to two over the last mile from Marsh Lane, while at the west end all lines converge to a bottle-neck over the canal bridge. Leeds is the terminus for a considerable local traffic, to and from Harrogate, via both Arthington and Wetherby, and on the L.M.S.R. Western Division route. There are also express services from Newcastle, York, Hull and Liverpool terminating there and through cross-country services between Liverpool and Newcastle to be dealt with. The seasonal traffic to the Yorkshire coast resorts, Bridlington, Scarborough and Whitby, however, provides the most difficult operating problems.

Individual Point Operation

As the traffic necessitates a very large number of shunting and light engine movements, it was decided to operate all points and signals worked by the West box from individual thumb switches located at the geographical positions on a triple control panel, although careful consideration was given to the possibility of using the route setting principle which was adopted at Thirsk, the pioneer installation of relay interlocking on the L.N.E.R. (described in THE RAILWAY GAZETTE of January 12, 1934, page 45.) The switches are coloured, red being used for colour light signals, white for the position light signals and black for the points. This panel covers some 4½ track miles and operates 33 main running signals, 20 calling on signals, 35 shunt signals and 64 pairs of points. It is constructed in three vertical planes, of which the centre and largest measures only 7 ft. long by 4 ft. high, and is painted a dark olive green, finished dead matt to avoid any chance of confusion due to shine or reflected light; against this background the indication lamps stand out well. Each track circuit is indicated by two white lights; red is used for the danger aspect of all signals; for the clear position green lights are used for main signals and white for subsidiaries. The position of each pair of points is indicated by white lights, marked N and R for normal and reverse respectively. The whole of the interlocking is what is known as relay or, more correctly, circuit interlocking and all the thumb switches are free to be turned at any time, but no signal will display a proceed aspect and no points will move unless it is safe for them to do so.

The operating staff has a well laid-out room, giving an excellent view of the lines; all four walls are glazed practically from floor to ceiling. In addition to the control panel there is the necessary apparatus for linking up with adjacent cabins. On the westbound lines, block telegraph working is in force between Farnley Junction, on the L.M.S.R. Western Division line to Manchester, and the new West box, but Leeds Junction box signals concerned are slotted.

Information as to whether trains leaving in the direction of Manchester are routed via Dewsbury or the Heckmondwike loop is sent to Farnley Junction by a two-way thumb switch on the panel. The East and West boxes are connected by slotting, but before initiating a movement the East signalman has to obtain a release from the West box. All running signals are approach locked, and it was thought desirable to provide time releases—to free them in the event of a wrong route being set up—operated by push buttons housed in a small cabinet at the right-hand end of the main panel, with mechanical interlocking to prevent more than one being depressed at a time.

The control room is heated by tubular electric heaters and a small electric cooker is provided for the use of the signalmen. A spacious linemen's store and workshop is also provided in the West signal box.

Signals

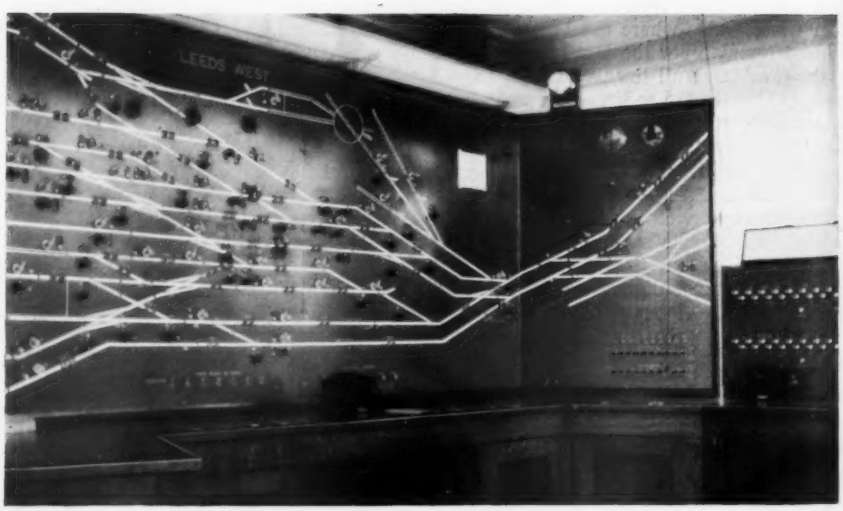
Long range day colour-light signals of the single lens, or searchlight, type are used for all running movements. The majority exhibit three aspects, but in one or two instances a fourth aspect is necessary on account of limited braking distance. This has been provided by an auxiliary light unit mounted above the main lens, to give the double-yellow indication when required.

Shunt and subsidiary signals are of the position-light type. Subsidiary signals show a single aspect only, consisting of two white lights arranged diagonally, mounted at a distance of 2 ft. below the main signal lens to which they refer and are normally dark. Shunt signals are mounted on the ground and exhibit two horizontal lights for danger, or two diagonal lights for clear; they have back lights, and the danger aspect of those reading over trap points includes one red light. Standard high-voltage lamps are used in these signals behind a lens combination including a pale blue glass. This gives a remarkably good indication by day, so much so that a change-over switch is provided in the signal box to reduce the voltage to one half at night.

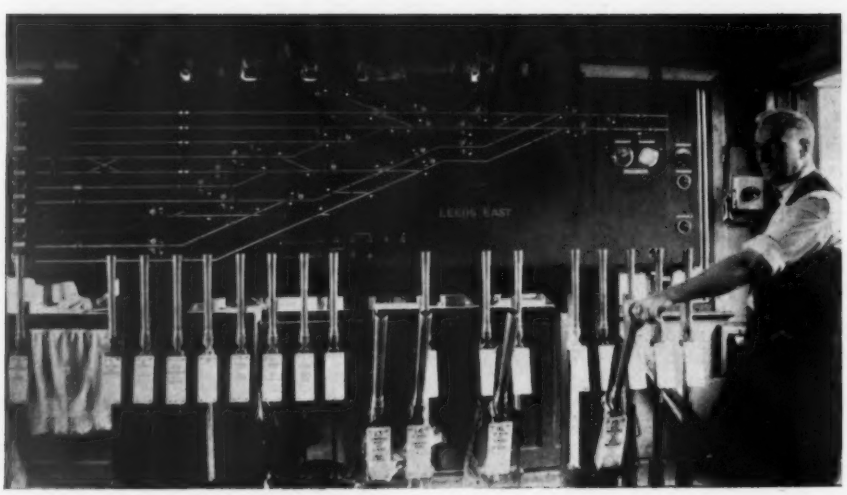
The fullest possible use has been made of route indicators, to reduce the number of signal lights displayed to a minimum. They are all of the multiple lamp, or theatre-sign type, and display a letter or figure about 15 in. square. A maximum of 49 lamps are used, arranged in the form of a square, 7 aside, and with this large number of lamps an accurately shaped letter or figure is displayed. The indicators appear if a colour-light signal displays a "proceed" aspect or if a subsidiary signal below it is cleared for an occupied platform.

Whereas at the east end of the station, as above explained, the points are still worked manually, at the west end, with the exception of the crossovers adjacent to the buffer stops on the bay platform roads 7, 8, 9 and 10, they are electro-pneumatically operated. The point mechanisms are of the Westinghouse standard type

Left: Leeds West box, showing also position light shunt signals in foreground



Right: Part of the control panel in West box, showing (on right) release buttons for approach locks



Left: Control panel in East box and mechanical frame for working points

introduced over 30 years ago, modified only in respect of the electric detector. The point control valve, however, is of new design and is known as the "C.P.," by which the air supply to the cylinder is cut off the moment full operation and locking of the points are completed. Generally the complete mechanism, including operating cylinder, escapement gear, facing point lock, and electric detector, is carried on a single bed plate mounted in the six-foot, but in certain cases where, owing to the proximity of other roads, this is not possible, the operating cylinder and escapement have had to be located some distance away and a separate facing point lock and electric detector installed in the four-foot. Some of the most awkward change-over work occurred in connection with the point layouts, and no little ingenuity was exercised in accommodating the temporary mechanical facing point locks and their connections alongside the new material after the latter had been fixed in readiness.

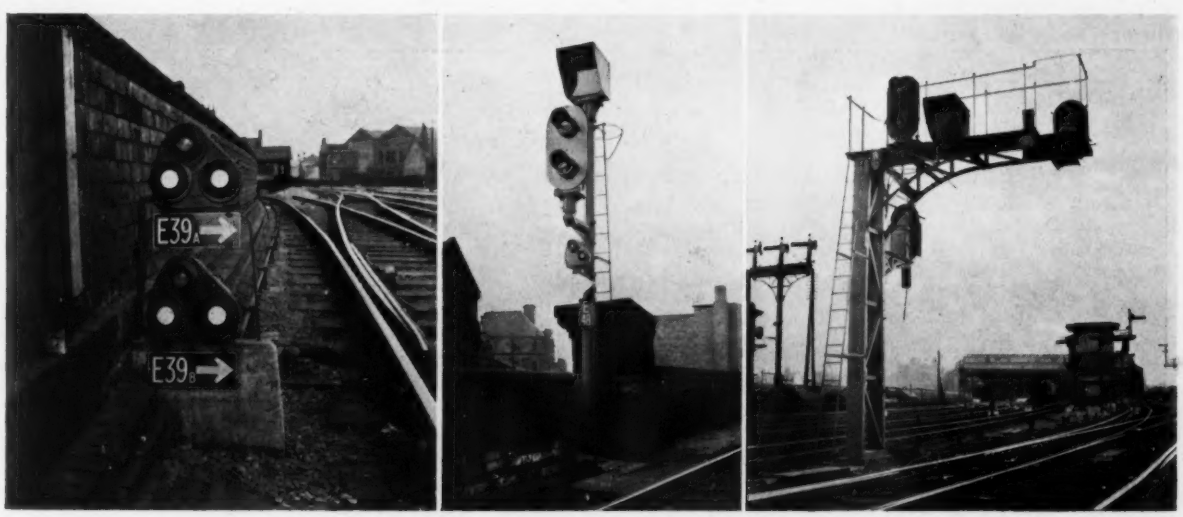
Mechanically-operated and electrically-detected double slip layout at east end of yard, with East box in background

The air compressor plant consists of two 6 h.p. electrically-worked sets, only one being normally in use at a time. The set will start as soon as the pressure in the air mains falls to a pre-determined level (about 50 lb. per sq. in.) and run until a pressure of about 60 lb. per sq. in. has been attained. Should the pressure drop below 50 lb. the second set will automatically be switched in also, and an alarm bell will ring in the control room so that the maintenance staff may be advised. This plant is housed on the ground floor of West box.

The crossovers leading from the ends of Nos. 7, 8, 9 and 10 platform roads are worked by ground frames. Electric locks are fitted to the levers which can be released by the operation of thumb switches on the panel in the signal box. The control circuits are of course suitably interlocked with those of the adjacent points and signals.

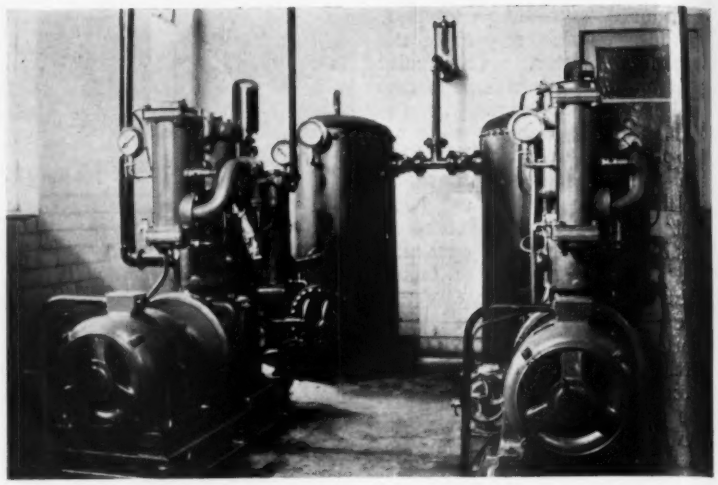
Track Circuit and Interlocking Equipment

The track circuits are of the a.c. reactance feed type, using resonated relays, supplied from feed sets housed in compact steel cases located adjacent to the rails, but the majority of the track relays are in the signal box. Track circuits of this type have the particular advantage that they can be pre-adjusted, any changes in the weather and consequent variations in ballast leakage being automatically compensated in the track feed, and a train shunt of not less than 0·5 ohm. maintained under all conditions without the necessity of further adjustments. There is a full point and sectional route control throughout the installation. The track and point indication relays are accommodated on the ground floor of the signal box, the d.c.



Left: Position light shunt signals E 39A and B. Middle: Signal E 48 with multiple lamp route indicator and calling-on signal below. Right: Bracket signal, W.62, showing four-aspect searchlight signal and multiple lamp route indicator

interlocking relays being arranged on the first floor, immediately below the control room. The interiors of the relay rooms are arranged to provide for easy access and maintenance; careful attention has been given to the placing of the windows so that no artificial light is needed during the daytime for inspection purposes. Last but not least the interior decoration is carried out in a very pleasing colour-scheme of green and cream, well calculated to give the staff a sense of pride in their charge.



Electrically-operated compressor plant for point operation

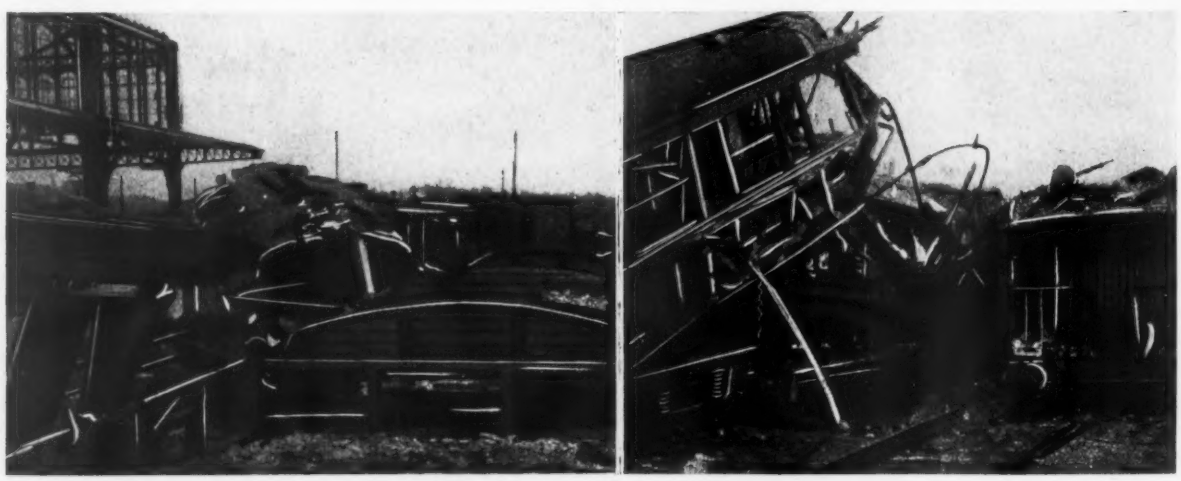
Power Supply

Power is taken from two independent Leeds Corporation supplies at 220 volts a.c., one being used as the regular supply, and an automatic contactor providing for an immediate changeover to the standby in the event of an interruption. This is then transformed down to 110 volts. From the main 100-volt bus-bars two supplies are taken, one to the West signal box bus-bars and the other to a step-up transformer, 110/660 volts, which supplies the East signal box 0·4 mile away. In the West box the air compressors, each of a capacity of 25 cu. ft. of free air per min., are fed from a separate a.c. 2-phase 440-volt supply. The indication lamps are fed from the 12-volt a.c. bus-bars, but the interlocking circuits by 12-volt d.c., supplied from Westinghouse metal rectifiers. A diesel-driven alternator is at present being installed to provide an emergency supply in the event of a total failure of the normal supplies. Paper insulated lead-sheathed armoured cable is used for all the outside wiring runs, and for the internal wiring in the cabin, flameproof compounded single conductors of the "ite" class are used.

Conclusion

A forest of signals and gantries has now given place to a very few colour-light and numerous ground shunt signals, and opportunity is being taken to reballast and generally tidy up the yard in keeping with the smart finish so characteristic of new works in the North Eastern area of the L.N.E.R. The new West cabin is a handsome example of the railway architecture emanating from York. Leeds New station is the joint property of the L.N.E.R. and L.M.S.R. and is at present worked and maintained by the former on behalf of the joint committee. The work, which was designed to the requirements of the Operating Departments of both companies, has been carried out under contract by the Westinghouse Brake and Signal Co. Ltd., of London and Chippenham, to the instructions of Mr. John Miller, Engineer, North Eastern Area, L.N.E.R., though the opening of the installation took place shortly after Mr. F. E. Harrison had succeeded him. The signalling scheme was originally designed by Mr. A. E. Tattersall, now Signal and Telegraph Engineer, Southern Area, under whose supervision a considerable portion of the work was completed. Mr. C. Carslake, who succeeded Mr. Tattersall as Signal and Telegraph Engineer, North Eastern Area, has since been responsible for the supervision of the completion and opening of this notable installation.

(*See editorial on page* 793)

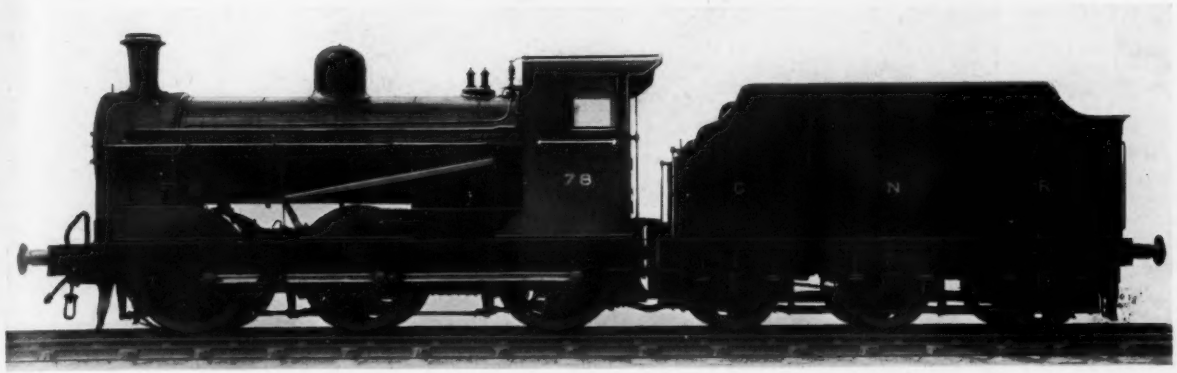


Arrival platforms after passage of bombers *Remains of coaches on the damaged tracks*

DAMAGE AT MADRID NORTHERN STATION BY INSURGENT AIR RAIDS (*see description on page* 799)

NEW 0-6-0 LOCOMOTIVES, G.N.R. (I).

A series of five light 0-6-0 locomotives is being introduced for mixed traffic work on the Great Northern Railway (Ireland)



THE first of a batch of five new 0-6-0 type locomotives has recently been completed at the Dundalk works of the Great Northern Railway (Ireland) to the designs of Mr. George B. Howden, the company's Chief Engineer. The locomotives are classified "UG" and will bear the numbers 78 to 82. They are intended for use on light goods and excursion trains and the axle loading of just over 15 tons will enable them to be used on all sections of the system as well as to run through with excursion trains via Cookstown or Antrim and thence over the L.M.S. Northern Counties Committee line to Portrush.

The principal dimensions of the new engine are:—

Cylinders, dia.	18 in.
Piston stroke	24 in.
Wheels, coupled dia.	5 ft. 1 in.
Wheelbase, rigid	15 ft. 7½ in.
,, total engine and tender	36 ft. 3½ in.
Boiler—	
Heating surface, firebox	106·0 sq. ft.
Tubes	757·0 sq. ft.
Total evaporative heating surface	863·0 sq. ft.
Superheater heating surface	168·6 sq. ft.
Heating surface (combined) total	1,031·6 sq. ft.
Grate area	18·3 sq. ft.
Steam pressure	200 lb. per sq. in.
Weight of engine in working order	45 tons 12 cwt.
,, tender ,, ,,	38 tons 10 cwt.
Total weight (engine and tender)	84 tons 2 cwt.
Tractive effort at 85 per cent. of boiler pressure	21,671 lb.

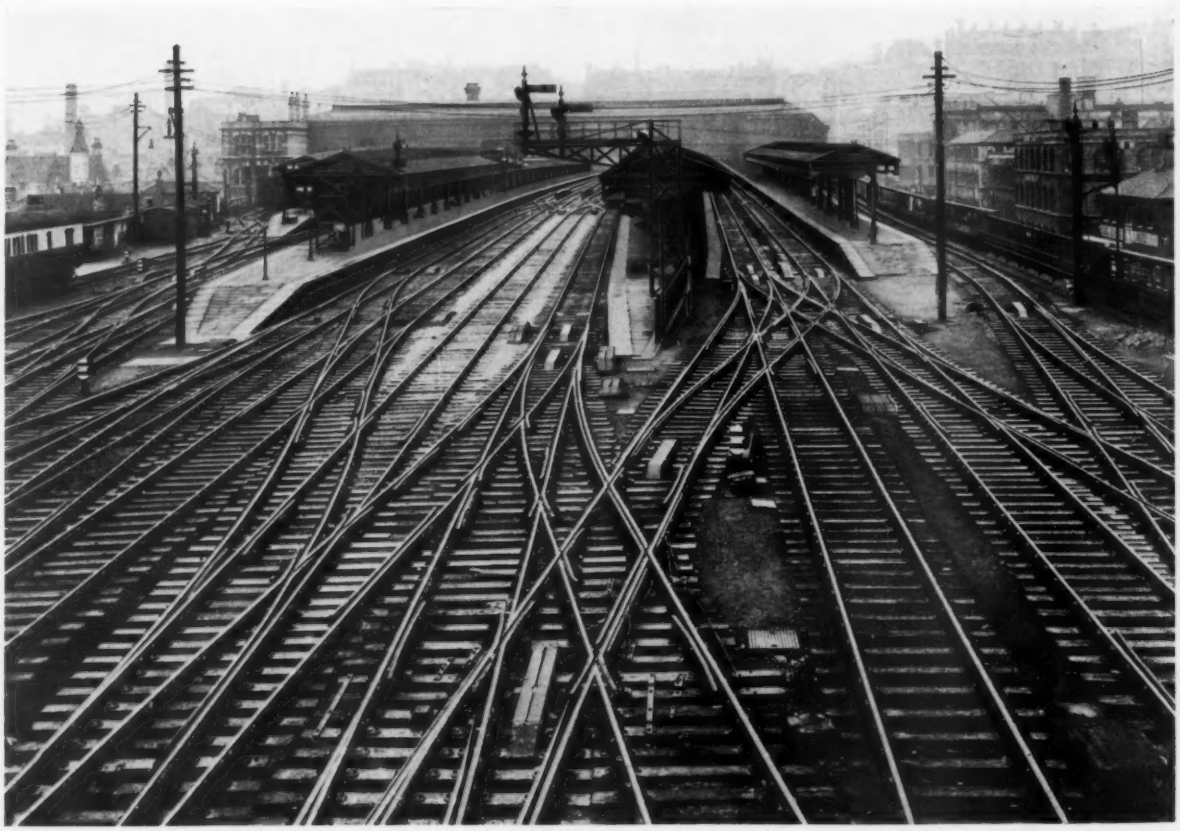
In the general construction as many standard parts as possible have been used, the boiler, cylinders, motion, and crank axle being interchangeable with those of the "T2" class standard 4-4-2 tank engines, and the "U" class tender engines. The wheels, however, are of the standard diameter of the larger goods engines, and together with the coupling rods are almost identical with those on the latter engines. The boiler, which has a Robinson type 16 element superheater and the company's standard types of injectors, ejectors, water gauges, safety valves, &c., is designed for a working pressure of 200 lb. per sq. in. The locomotive is mechanically lubricated, a six-feed Wakefield lubricator feeding the axleboxes, and a four-feed, with anti-carboniser, supplying the cylinders and piston valves. Both lubricators, one on each side, are driven from the crosshead. The driver's cab is very roomy and has a sliding window on each side. Tip-up seats are provided for driver and fireman, the former being on the left-hand side. The regulator handle is of the extended type for convenience when shunting. Steam sanding is applied to the front of the leading wheels only. Owing to the shallowness of the smokebox an ash ejector has been fitted experimentally. The tender is of the company's latest standard type and has a capacity for 3,500 gallons of water and six tons of coal.

Improved Position of the Reichsbahn

The increase of industrial activity in Germany in 1936 had a marked effect on railway traffic, and although the official report and statement of accounts have not yet appeared, a fairly accurate estimate of the year's working has been published. The traffic due to the Olympic games influenced the position, which showed an improvement in almost every month of the year. Train, passenger, and goods kilometres all increased so much over the 1935 figures as to show an improvement even over the last pre-war year, though still less than in the record year 1929, before the depression. Passenger and parcel receipts have risen 7·7 per cent., from 989 million marks in 1935 to 1,065 million; goods receipts from 2,324 to 2,620 millions, or 12·7 per cent. Passenger kilometres rose 9·1, and tonne-kilometres, 11·8 per cent. Receipts have not risen in proportion to the load-kilometres, compared with 1929 figures, for although there was a 5 per cent. increase in certain rates on January 20, 1936, so many special rates have been introduced that revenue is affected considerably. It has also to be remembered that a good deal of traffic in connection with winter relief and certain public works has been conveyed at merely nominal charges. Total traffic receipts are estimated to be 3,960 million marks, 10·4 per cent. more than in 1935, and operating expenses 3,500 millions, leaving a balance of 460 millions, to which some miscellaneous receipts may be added. Practically all of this will be absorbed, however, in meeting numerous charges and contributing to the depleted reserve funds and redemption of loans, so that little, if any, net profit will be made. There is no prospect that the 1936 increase in rates can be abolished, although industrial circles are strongly pressing for it. The Reichsbahn has continued to provide the technical staff for the construction of the national motor roads, for which it provided 50 million marks of capital.

XUM

"Lord Anson," Southern Railway 4-cylinder 4-6-0, carrying a 4-ft. square Crusader badge on the visit of the Crusaders' Union to Southampton Docks and the Cunard liner "Queen Mary," on Tuesday, April 13. This badge has now been carried by L.N.E.R. Pacifics, L.M.S.R. "Royal Scots," and G.W.R. "Kings" on various Crusader excursions. *See editorial comment on page 790*



Snow Hill station, Birmingham, Great Western Railway. View of the permanent way layout at the north end

RAILWAY NEWS SECTION

PERSONAL

Mr. Kennedy Stewart was on April 7 appointed a Director of the Belfast & County Down Railway, in succession to the late Sir Samuel Kelly, whose death was reported in THE RAILWAY GAZETTE of February 12.

At an Investiture recently at The Viceroy's House, New Delhi, the Governor-General of India conferred the honour of knighthood upon Sir P. R. Rau, Financial Commissioner of Railways, whose honour was announced in the New Year Honours list, published in our issue of February 5.

INDIAN RAILWAY STAFF CHANGES

Mr. V. L. Thompson, Deputy Traffic Manager, A.-B.R., has been granted long leave as from March 16, and Captain J. H. Stamford-Smith has been appointed to act in his place.

Mr. A. R. A. Hare Duke, Deputy Controller of Stores, E.I.R., has been granted six months' leave from March 24.

Mr. A. H. Rudd, who, as recorded in our issue of April 16, retired from the position of Chief Signal Engineer of the Pennsylvania Railroad on March 31, had attained the age of 70. His signalling experience extended over more than 49 years, and he was a recognised authority in signal practice. After graduating at Yale in 1886, he joined the Pennsylvania system as a draughtsman, first in the Real Estate and then in the Signal Department, but from 1892 to 1903 he obtained experience in signal work on the New York Central, New Haven, and Lackawanna systems. In the latter year he returned to the P.R.R. as Assistant Signal Engineer, Lines East of Pittsburgh. He became Signal Engineer in 1907, and in 1920 was promoted to be Chief Signal Engineer of the whole system. Mr. Rudd was mainly responsible for the introduction of position-light and cab-signalling, and was also largely concerned with the standard flashing light signal for the protection of level crossings. He was Chairman of the Committee on Highway Protection, is a Past-President of the Yale Engineering Association and American Signal Association, and a life member of the American Railway Engineering Association. He was, in 1910, elected the first foreign honorary member of the Institution of Railway Signal Engineers of Great Britain.

Mr. C. G. Page, M.C., B.A., Parliamentary Officer of the London Passenger Transport Board, has been appointed to take charge of the Department of Secretary and Treasurer, with the title of Secretary and Chief Legal Adviser; he will also continue his duties as Parliamentary Officer. The appointment follows the recent death of Mr. J. S. Anderson, who was Secretary, Treasurer, and Solicitor to the board, and whose death we recorded in our issue of April 16. Mr. Page's appointment dates from April 19. He was born in London in 1885, and completed his education at Trinity Hall, Cambridge, where he obtained his B.A. In 1910 he was called to the Bar, and three years later was appointed Legal Assistant to the Underground group of companies. From 1914 to 1919 he was on war service, being twice wounded and awarded the M.C.; he held the rank of Major in the Border Regiment. In the latter year Mr. Page returned to the Underground group as Legal and Parliamentary Officer, which position he held until the formation of the London Passenger Transport Board, in 1933. He was then appointed Parliamentary Officer to the board, in the formation of which he was actually engaged, as also with the transfer negotiations of the various companies and local authority tramway undertakings absorbed, and with staff compensation claims arising under the Act of 1933.

Photo [*Vandyk*

Mr. C. G. Page, M.C., B.A.,

Appointed Secretary and Chief Legal Adviser, London Passenger Transport Board

We regret to note the death, on April 11, of Mr. O. F. Walford, former Secretary of the Dominion Atlantic Railway, a line leased to the Canadian Pacific Railway.

Sir Miles Cecil Ives, sometime Manager of the former Central London Railway, whose death on February 23 we announced in our issue of February 26, left estate valued at £4,826 (£4,589 net).

Sir Henry Jackson, Bt., M.P., B.Sc., M.B., late Chairman of the London and Home Counties Traffic Advisory Committee and its representative on the board of appointing trustees to appoint the members of the London Passenger Transport Board, left estate valued at £20,044 (£19,685 net). His death was announced in our issue of February 26.

We regret to note the death, on April 11, of Mr. E. E. Sawyer, a former Director of the Madras & Southern Mahratta and West of India Portuguese Railways. In his younger days he was employed on railway work in India, and contributed a paper to the Institution of Civil Engineers upon the latter railway. Long after retirement he served as representative of the Ministry of Munitions on the Continent during the war.

G.W.R. (LONDON) OPERATIC SOCIETY

Mr. F. R. Potter, Superintendent of the Line, and Chairman of the Great Western Railway (London) Operatic Society, presided at the seventeenth annual dinner and dance held at the Wharncliffe Rooms last Saturday. The President of the society, the Rt. Hon. Lord Palmer, replied to the toast of "The G.W.R. (London) Operatic Society," which was proposed by Mr. C. R. Dashwood. Mr. G. H. Hemmen proposed the toast of "The Visitors," which was responded to by Mr. A. S. Quartermaine.

Miss H. Catto, who, as announced in THE RAILWAY GAZETTE of April 2, has been appointed to the position of Welfare Assistant (Women and Girls)

to the Chief Officer for Labour and Establishment, L.M.S.R., took her degree at Edinburgh University and also studied at the London School of Economics. She has had a varied and exceptional experience as a welfare worker, and during the war was engaged on the dilution of staff employed in marine engineering on the Clyde. She subsequently became Welfare Officer at the Ministry of Labour in connection with the resettlement and training of women war workers, including those on active service. In 1923 Miss Catto took over the duties of Divisional Welfare Supervisor for the L.M.S., her jurisdiction extending over the whole of Scotland and parts of the North of England and Ireland, and it is this position in which she has remained until taking up her new duties as Welfare Assistant at headquarters.

Miss H. Catto, M.A.,

Appointed Welfare Assistant (Women and Girls) to the Chief Officer for Labour and Establishment, L.M.S.R.

We regret to record the sudden death of Mr. Thomas R. Dester, General Traffic Manager, Associated British Railways Inc., New York, who was found dead in a train on arrival at Chicago on Wednesday. Mr. Dester began his railway career at Derby in the office of the General Superintendent of the former Midland Railway, and after graduating through the Excursion, General, Rates and Fares, Parcels, Claims, and other sections of the department was for some years connected with the canvassing and operating of theatrical traffic on the Midland. In the war, Mr. Dester served in France from July, 1915, to November, 1919 (except for eight months in hospital as a result of wounds and gas), with the Royal Fusiliers (London Regiment). When discharged in November, 1919, Mr. Dester held the rank of Captain and Adjutant. He returned to the Midland Railway in the office of the General Passenger Agent, and on the formation of the L.M.S.R. was transferred to the department of the General Superintendent (Passenger Commercial), serving under Mr. Ashton Davies as head of the General Section in the Passenger Commercial Department. In 1928 he was appointed General Passenger Agent in America for the L.M.S.R., and in 1934 became General Traffic Manager of the Associated British Railways Inc., with offices in New York. Referring to Mr. Dester's death, Sir Josiah Stamp, Chairman of the L.M.S.R., has said: "Mr. Dester's death comes as a great shock and is a great loss to the British railways. I have known him for many years."

The late Mr. Thomas R. Dester,

General Traffic Manager, Associated British Railways Inc., New York, 1934–1937

G.W.R. Ambulance Presentation at Leamington.—The annual concert and social gathering inaugurated by ambulance workers in the G.W.R. Birmingham Division, took place in the Winter Hall, Leamington Spa, on Friday, April 9, when Mr. W. E. Hart, Divisional Superintendent, presided over a large and enthusiastic company. He was supported by the Mayor of Leamington, Alderman C. H. Southorn, the Deputy Mayor, Alderman R. F. Bury, Messrs. F. K. Pelley, District Goods Manager, H. S. B. Whitley, Divisional Engineer, J. A. Warren King, District Goods Manager, Worcester, and other local officers of the company, and medical lecturers to the respective classes. Mr. H. Adams Clarke (Staff Assistant to the General Manager) made a large number of presentations of the company's gold efficiency awards, including four for 35 years' service. Up to date, said Mr. Adams Clarke, no fewer than 2,391 efficiency awards had been gained throughout the G.W.R. system, and a large proportion of that number had fallen to the division. He was particularly pleased that two of their members, Messrs. R. H. Pole of Brierley Hill and W. E. Weaver, of Stourbridge, were to be invested by H.M. the King on May 25 as Serving Brothers of the Order of St. John. Mrs. Adams-Clarke presented the Bantock Cup to the Stafford Road advanced competition team, the Felix Fellows Cup to the Wednesbury beginners' team, and a number of prizes gained by reserve men. Members of the Southam Road class received their examination awards at the hands of Mr. H. S. B. Whitley, while those for the Southam Road and Stratford-on-Avon classes were distributed by Mr. F. K. Pelley.

Unveiling ceremony at Paddington on April 14, of G.W.R., Castle class, 4-6-0 locomotive, No. 4037, now named "The South Wales Borderers" (see last week)

Ancillary Businesses of British Railways in 1936

II.—Hotels, Refreshment Rooms, and Cars

This ancillary business has assumed considerable importance in recent years, partly on account of its profitable nature and partly because of the valuable contribution which it makes to the amenities of rail travel. The following table, showing the individual results obtained by the four group companies last year compared with 1935, bears striking witness to the revenue earning potentialities of railway catering:—

Company	Receipts		Expenditure		Surplus		Per cent. of surplus to gross receipts	
	1936	1935	1936	1935	1936	1935	1936	1935
	£	£	£	£	£	£		
G.W.R. ...	744,785	699,457	666,487	620,871	78,298	78,586	10·5	11·2
L.N.E.R. ...	1,953,549	1,839,019	1,789,403	1,714,728	164,146	124,291	8·4	6·8
L.M.S.R. ...	2,985,241	2,861,859	2,596,369	2,482,242	388,872	379,617	13·0	13·3
S.R. ...	139,900	128,923	131,190	123,188	8,710	5,735	6·2	4·4

It will be seen that each company recorded a substantial increase in gross receipts. In the case of the G.W.R., however, the net result was not quite up to the high standard of 1935 on account of the cost of provisions, wines, and spirits, having risen in slightly greater proportion than the receipts, in addition to which there were fairly substantial increases in the cost of salaries and wages, and maintenance.

L.N.E.R. gross receipts advanced by over £114,530, and as there was no appreciable increase in expenditure apart from that in respect of provisions, &c., in consequence of the additional business secured, the net result increased by no less than £39,855, or 32·1 per cent.

Some idea of the magnitude of the L.M.S.R. catering business may be gained from the fact that gross receipts last year amounted to nearly £3,000,000, which was more than one-half of the total catering receipts of the four groups. This represented an increase of £123,382 in gross receipts, but trade expenses increased very considerably, especially under the head of maintenance, which advanced by nearly £61,000 to £314,702. An amount of £69,420 was transferred from renewal account, compared with £29,130 in 1935, with the result that the net profit showed a slight increase of £9,255.

The Southern Company's account is in respect of hotels only, the refreshment room and restaurant car business being in the hands of contractors. Receipts increased by nearly £11,000, and the net profit amounted to £8,710, an increase of £2,975 or 51·9 per cent. compared with 1935.

Railway Hotels

The importance of the chain of railway-owned hotels can hardly be overestimated. Not only do these establishments encourage tourism and increase the net revenue of the railways, both directly and indirectly, but they also serve a useful purpose in popularising districts where lack of adequate hotel accommodation has restricted development. An instance of this is provided by the decision of the G.W.R. to provide a first class hotel and golf course near Looe in conjunction with the new railway from St. Germans to Looe, the principal object of the whole scheme being the development, on the best lines, of the comparatively little-known coast of south-east Cornwall. A provisional licence has been granted, and it is possible that the construction of the new hotel may be commenced this year.

It is difficult to conceive of any organisations better fitted to control this type of hotel than the railway companies. They have the necessary experience and organisation ready to hand; their financial resources make it possible for them to wait, if necessary, for profits; and they are able to ensure the necessary degree of co-ordination between the hotels and transport.

The year 1936 was notable for several interesting improvements to railway-owned hotels. The G.W.R proceeded with its modernisation scheme at the Great Western Royal Hotel, Paddington. A new wing, which compares favourably with the finest hotel accommodation in London, was opened in July last, and the exterior has been transformed by the provision of a new carriage drive, complete with handsome canopy and entrance. Work is now in progress on the west wing, but it is not likely that the whole scheme, designed to place this well-known establishment in the front rank of London hotels, will be completed this year. The business at the company's Manor House Hotel, situated on the fringe of Dartmoor, improved last year to a remarkable extent and afforded ample justification of the enlargement scheme completed towards the end of 1935.

The L.N.E.R. has incurred considerable expenditure on the modernisation of its hotels in recent years, a policy which was emphatically justified by the substantial increase in gross and net receipts last year. Incidentally, most of this company's expenditure on hotel modernisation has been charged to revenue or revenue reserve funds. Last year, improvement schemes were carried out at the Station Hotel, Newcastle, the Great Northern Hotel, Leeds, and the Aberdeen Station Hotel.

The L.M.S.R. hotels have nearly all received attention within the last few years. The hotel at Kyle of Lochalsh was re-opened last year after having been completely rebuilt, and a most successful season was experienced. Progress was made with the remodelling of the greater part of the ground floor of the Midland Hotel, Manchester, and the building of the new hotel at Leeds was well advanced. A striking tribute to the worldwide reputation of the L.M.S.R. catering organisation was made by the South African authorities, at whose request the company assumed complete charge of the catering arrangements at the International Exhibition at Johannesburg.

Refreshment Rooms and Restaurant Cars

The companies' refreshment room accommodation is constantly being improved and modernised, and, as in the case of hotels, the policy has been found beneficial. Until recent years the catering potentialities at the London termini and the principal provincial stations were not fully exploited, and the provision of more commodious and up-to-date accommodation has resulted in a substantial increase in business which has proved beyond all doubt that the travelling public appreciates, and is ready to patronise, facilities which afford the opportunity of obtaining attractively served refreshments in comfortable rooms and restaurants.

Restaurant car facilities continue to expand, and the past year witnessed the introduction of three different types of buffet car. The G.W.R. placed in service two new cars which, in addition to a buffet apartment with eight pedestal seats at the counter, have three passenger compartments seating a total of 24 persons. The compartments are equipped with tables, and are reserved for passengers taking refreshments. The L.M.S.R. also constructed a new type of car designed to seat 24 passengers at tables in a large open saloon, at one end of which is a bar counter and kitchen accommodation for the preparation of light meals. The seats are of the double and single armchair type, arranged on either side of a centre gangway. The first buffet car to operate on the Southern Railway made its appearance last July when the Pullman Car Company placed one of these vehicles in service on the Newhaven boat train. In this case, the accommodation is arranged to provide a small saloon seating 8 passengers at tables; a large buffet compartment with pedestal seats for 11 persons; and a pantry and kitchen. It is interesting to note that all three types afford some seating accommodation at tables, a policy which was advocated in THE RAILWAY GAZETTE of May 8, 1936, when reviewing the catering results for 1935.

Handling Holiday Traffic in France

(See editorial on page 791)

The traffic handled by the French railways over the Christmas holidays of last year was the greatest on record in that country, and a recent issue of the *Revue Générale des Chemins de Fer* gives some interesting details of the way in which the increased demand was met by the P.L.M. Company, which was one of the lines chiefly affected. As compared with 1935, the number of bookings from the Gare de Lyon, Paris, increased by 19·8 per cent., and as regards provincial centres, Lyons showed a 17·4 per cent. increase, St. Etienne 20·3 per cent., Nice 25·7 per cent., and smaller towns like Nîmes and Besançon 32 per cent. Over the entire P.L.M. system 362 additional trains were run, as compared with 314 in 1935, an increase of 15 per cent. Principal interest attaches to the working between Paris and Dijon, a densely occupied main route, 196 miles in length, and although now in course of extensive quadrupling, still to an extent of about one-half ordinary double track only. On December 23 from 7.30 in the evening until half-an-hour after midnight, 51 important fast trains left the Gare de Lyon, exceeding by 9 all previous records; four of these were for the Bourbonnais route, diverging at Mélun, but the remaining 47 were all for beyond Dijon, giving an average headway of just over 6 min. per train from the start, spreading out to an average of 7 min. headway, or slightly over, through Dijon. Matters were complicated by a thick fog round Paris, notwithstanding which the graphic diagrams of the working show that all the trains were got away with commendable smartness. In order not to overtax the capacity of the line beyond Dijon to Ambérieu, used by all the trains for the winter sports resorts of Savoy and for Italy, two trains for Bourg—St. Maurice were routed via Lyons and Montmélian, and a sleeping car express for St. Gervais-les-Bains via Lyons (Brotteaux). In the reverse direction, the twelve arrival platforms at the Gare de Lyon had to handle, between 6 p.m. on January 3 and 1.10 a.m. on the following day, 39 long-distance and 28 suburban arrivals; while on the morning of January 4 58 long-distance and 37 suburban arrivals were dealt with, making a total of 97 long-distance arrivals in 18 hr.

For forming the outgoing trains additional to the normal service 600 bogie coaches and 150 vans were concentrated at Villeneuve sidings, 6 miles from the terminus, and the remainder of the stock came from Conflans. On December 23 alone 10,570 individual places were reserved in outgoing trains, and 7,700 more for parties. The demand for locomotive power taxed the locomotive sheds at Paris, Laroche, and Dijon-Perrigny severely. The Paris depot had to find approximately 68 per cent. more power than on a normal day; of the 157 locomotives of all types normally attached to the shed, only 7 were incapable of use owing to needing repair, and 69 locomotives, of which 51 were for *rapides* and express trains, were turned out from the shed to be available at the terminus between the hours of 7.30 p.m. and 12.30 a.m. alone on the night of December 23-24. On the same day only 5 men out of 205 constituting the locomotive *personnel* at the shed, were unavailable, by sickness or other causes. At Dijon-Perrigny, on the same night, 80 engines of down trains and 70 engines of the up trains entered or left the depot tracks between 11.30 p.m. and 5.30 a.m.

At provincial stations the biggest problem presented, in relation to facilities available, was at St. Gervais-les-Bains—Le Fayet, owing to the enormous popularity of the adjacent snowfields with ski enthusiasts. St. Gervais, where change is made from the standard gauge on to the metre-gauge electric line serving the Chamonix valley, is a station with only two standard gauge platforms, and is approached by over 60 miles of single track. Normally it receives 2 *rapide* and 2 ordinary trains between 6.35 and 9.45 a.m., but on the morning of December 24 this became 8 *rapide* and 2 ordinary trains, four of the *rapides* being at ten-minute intervals; in consequence of this line occupation, two ordinary trains in the opposite direction were cancelled and replaced by road motors. But the return traffic after the holiday was even more dense. Between 4 and 9.30 p.m. on January 3, a total of about 8,000 skiers and others presented themselves at St. Gervais for transport; eight trains to Paris were necessary between 7 and 9.30 p.m. instead of the normal 2, and 14 trains in all left during this period, all of which had to be double-headed over the severe gradients between La Roche-sur-Foron and Bonneville. Over the week-end 150 bogie vehicles were stored in readiness, in the limited siding accommodation at St. Gervais, and during the day were prepared and formed for the evening exodus on January 3. Loudspeakers were of considerable assistance in marshalling the passengers at St. Gervais, and the succession of fourteen trains was worked over the single line at intervals of 15 to 20 min. between each, exactly to time.

A Remarkable L.M.S. Locomotive Performance

One of the fastest journeys on record from Leicester to St. Pancras was made on March 23, with the Thames-Clyde Express, when the journey of 99·1 miles was completed in 95 min. 48 sec., including permanent way and signal delays which made the net time 93½ min.—11½ min. less than the schedule of this train. Leaving Leicester 9 min. late, with a nine-coach train totalling in weight 280 tons behind the tender, Driver Towers reached St. Pancras on time, notwithstanding the handicap of bad weather conditions, with driving snow; the engine was 3-cyl. 4-6-0 No. 5634, *Trinidad*, of the "5X" class. Between Kettering and Kentish Town nearly 10 min. was recovered in a distance of 70·5 miles. From Desborough North Signalbox to Kentish Town 77 miles were run in 67 min. 25 sec., at an average of 69·3 m.p.h. for the entire distance, which includes a 2¾-mile ascent at 1 in 120, and a total of 20 miles adversely inclined at 1 in 200.

Indeed, some of the most noteworthy work was done on the rising gradients, particularly in the time of 4 min. 52 sec. for the 5·2 miles from Wellingborough to Sharnbrook Summit (which includes the 2¾ miles at 1 in 120, and is allowed 7 min.), and 19 min. 16 sec. from Bedford up to Luton (allowed 22 min.). At four different points on the journey speed exceeded 80 m.p.h., and the maximum attained was 86½ m.p.h., near Oakley and again near Radlett. The times and speeds were recorded by Mr. Cecil J. Allen.

L.M.S.R. Leicester—St. Pancras

Engine: 3-cyl. 4-6-0 No. 5634, *Trinidad* (Class "5X").
Driver: G. Towers, Fireman: Simnett (Leicester shed).
Load: 9 coaches = 263 tons tare, 280 tons gross.

Miles		Sched. Min.	Actual. Min. sec.	Speeds. M.p.h.
0·0	LEICESTER	0	0 00	—
3·7	Wigston ...	—	6 02	—
9·4	*Kibworth North*	—	12 38	52½
12·8	East Langton	—	15 48	76½
16·2	MARKET HARBORO'	19	18 42	—
			p.w.s.	30
20·6	*Desborough North*	—	25 09	37½
23·5	Glendon ...	—	28 17	—
27·1	KETTERING	31	31 14	80½/*72
30·9	Finedon ...	—	34 19	77½
34·1	WELLINGBOROUGH	37	36 46	†79
39·3	*Sharnbrook Summit*	44	41 38	50½
46·1	Oakley ...	—	47 09	86½/79
49·3	BEDFORD...	53	49 30	85
57·3	Ampthill ...	—	56 27	57½
61·8	Harlington ...	—	61 09	‡61
66·3	Leagrave ...	—	66 23	50
68·9	LUTON ...	75	68 46	—
71·8	Chiltern Gn.	—	71 22	76½
74·5	Harpenden ...	—	73 34	69
79·2	ST. ALBANS	85	77 31	—
83·9	Radlett ...	—	80 56	86½
86·7	Elstree ...	—	83 11	66
92·2	HENDON ...	96	87 33	82
95·6	Finchley Rd.	—	90 42	—
97·6	KENTISH TOWN	102	92 37 sigs.	—
99·1	S. PANCRAS	105	95 48	—

* Reduced to 72 m.p.h. through station.
† Speed at foot of Irchester bank.
‡ Speed at dip beyond Flitwick.

Transport Developments in 1936

Précis of a paper read by Mr. R. Bell, C.B.E., Assistant General Manager, L.N.E.R., before the Institute of Transport in London on Tuesday

In most parts of our universe 1936 was a year of quickening progress in trade and industry, and there was a feeling that times were better than anyone had known since the great depression started in the year 1929. In spite of the barriers raised on all sides against the free exchange of commodities, the resilience of commerce has been strong enough to lift the volume of international trade to four-fifths of the level reached seven years ago. For the year 1936 various trade barometers indicated an advance in trade activity which reflected a boom in steel making and a substantial improvement in engineering and shipbuilding. Under these conditions the outlook for the railways has appreciably brightened, though their rate of progress lags behind the pace of development in general industry. Last year the four groups earned a net revenue of £35,730,000. That was an advance of 8½ per cent. on 1935, but an increase of four times that size would have left the companies short of their 1929 revenue of £45,000,000.

The passenger train traffic of the four main line companies was fairly good last year. The number of journeys started at their stations increased by 24 million, or 2 per cent., and the amount of the fares paid was higher by nearly £2,000,000, or 3·8 per cent. Detailed records of passenger journeys show that the railway has regained a firm hold on long-distance travel. The experience of the passenger departments in this country has been repeated in almost every detail in the United States, where for the third successive year American passenger traffic and revenue both increased. For the first time since 1924 American railroads carried more long haul than short haul or commutation passengers.

In 1936 the goods train receipts of the British railways were £87,722,000—an increase on the previous year of 4·7 per cent. Over the same period freight revenue advanced in America by nearly 17 per cent. to $3,264 million. The car loadings have persistently increased in America since August, 1935, and in September last reached a level of 800,000 for the first time for six years. The British railways do not publish wagon loadings though they keep records for their own use. On the L.N.E.R. the Rolling Stock Controller circulates a weekly statement of the loaded goods wagons forwarded from each district on the system, this being a valuable guide to the movement of traffic as the statistics come red-hot from the people who regulate the supply of wagons. The average wagon load last year was about three tons for light merchandise and ten tons for heavy traffics. These seem paltry records when compared with the car-loads of 26½ tons obtained in the United States. In both countries the demand for goods vehicles reaches a peak in October. The L.N.E.R. is providing some 10,000 more wagons for the boom in October next, at a cost of £1,750,000.

After much legal argument the Valuation for Rating Act of 1930 has been interpreted in such a way as to relieve the railways of an unjust burden of taxation, and the windfalls coming to the companies have, generally speaking, been utilised to refresh reserves weakened during seven lean years.

The working of the Road and Rail Traffic Act of 1933 has not been equally satisfactory. With its system of licences the Act has taken the first step to regulate the road haulage industry, but as at present applied its provisions are inadequate to restrict competition and to prevent economic waste. By April, 1935, licences had been issued for 460,000 vehicles to carry goods on the King's highway, and more than a fourth of this huge fleet was used for general haulage. Most of the hauliers had the first grant of a licence lasting for two years as a matter of right, and it was only towards the end of 1936 that the renewal of these certificates could be opposed. In accordance with the Act the railway companies lodged objections in certain test cases.

In America the Interstate Commerce Commissioners have recorded their opinion that the Motor Carrier Act of 1935, which has been effective for a full year, provides " a sound and workable system of regulation " for road transport, though they may wish to have some of its provisions strengthened at a later date. No longer in the States should the irresponsible haulier be able to force rates down to levels which are uneconomic for either road or rail.

In equally decisive fashion America is extending the newest form of transport. The air lines flying within the borders of the United States carried over a million passengers last year, the average length of journey being about 435 miles and the fare slightly under six cents a mile. This rapid progress would not have been possible without lavish aid from the State and municipal funds. There is consequently nothing astonishing about the losses incurred in the United Kingdom, where the range of flight is limited. The cost of flying an airplane mile may be put at 2s. 2d., and at present there is not sufficient traffic to produce a revenue of half that amount on routes between large cities like London, Glasgow, and Belfast. Need we wonder, therefore, at the absence of enthusiasm in the findings of the Maybury Committee, whose report on the development of civil aviation reached the Air Ministry in January last.

The Silver Jubilee must have knocked out any chance there ever was of flying services between Newcastle and London at a profit. Since the streamlined train started on September 30, 1935, it has run over 200,000 miles, and only on two or three occasions has the seven-coach set been replaced by an ordinary train while repairs were executed, and equally infrequent has been a hitch of any kind with the locomotive. Frequently the whole of the seats are booked well in advance, and the success of the Silver Jubilee, both from an operating and a commercial point of view, has been a magnificent advertisement for our railways. This year will see a number of additional experiments in high speed working both in this country and in America, where in six years the number of trains running at 60 m.p.h. and over has increased from 30 to 400, covering 19,000 miles on regular schedule.

In July the L.N.E.R. will introduce the Coronation, destined to do the journey between London and Edinburgh in six hours. On the West Coast route the L.M.S.R. is preparing to run the 401 miles between Euston and Glasgow in 6½ hours. Evidently high speed running is going to be a prominent factor in determining the future of railway transport. The success with which the steam locomotive has been adapted to the needs of accelerated services has for the present given pause to the use of diesel units. Probably it also supplies one reason why so few schemes are projected for electrifying lines outside suburban areas.

A few years ago there was talk of abolishing the Ministry of Transport as a measure of economy. Today it is recognised that the department is dealing with many subjects of great consequence to the national wellbeing, and its importance is likely to expand with the passing of the years.

The Mercantile Marine remains the care of the Board of Trade. The tramp shipping subsidy has been renewed up to the end of 1937, with a plain hint that a further extension is unlikely. The River Tyne was full of idle vessels a few years ago; now they are all gone. For the first time for five years there was an increase in 1936 of 117,000 in the gross tonnage of the world's merchandise shipping.

Real progress has been achieved all round during the past twelve months, with bright spots here and there. Everybody engaged in transport can go forward this year with trust in the future, but, to temper any undue confidence, it is well to keep in mind the saying of Mr. J. B. Eastman, who in June last demitted the office of Federal Co-Ordinator of Transport in the U.S.A. Through this unique experience Mr. Eastman is convinced that " no form of transportation can expect to prosper . . . unless it uses all the resources of modern engineering and scientific research, and shapes its organisation to that end; and to be effective it must for this purpose be an organisation of the industry and not of individual carriers."

The Battersea Collision Inquest

The inquest was resumed and concluded on April 20 before the Coroner for Battersea, Dr. Edwin Smith, on the bodies of the 10 persons killed by the collision near Battersea Park station, Southern Railway, on April 2. The initial proceedings and a report of the accident appeared in our issue of April 9.

Mr. William Bishop, Solicitor to the Southern Railway, said that his company accepted full legal responsibility for the effects of the accident. The Coroner, addressing the jury, said it would be futile for them to attempt to go into all the technical details. The signalling had been found free from failure. The only other possibility would seem to be a human error, through the signalman at Battersea Park being in some sort of difficulty. He thought his apparatus was out of order, broke a seal and manipulated something by hand to try to rectify matters. They were told that this was not an emergency such as would justify that. The signalman was an experienced, high-grade relief man, but it was his first day in sole charge of that particular box. He thought his apparatus was out of order, but what in fact occurred was that a signal was given to the next box that the line was clear when it was not.

Mr. H. E. O. Wheeler, Superintendent of Operation, said the ability to see the standing train would be interfered with by the curve and bridge girders. Lt.-Col. G. L. Hall, Assistant Engineer, Signals and Telegraphs, explained the principles of the lock-and block apparatus; accidents due to the human element were very rare with it.

Arthur Anthony, driver of the second train, said that the signals, except the distant, were clear. Visibility was bad owing to drizzle. He was driving at ordinary speed and at first thought the standing train was on the down main line and was perhaps an empty, from the white head screen. After the crash he got out and helped to release passengers. He saw his guard, who said the signals were off. Robert William Adamson, the guard in question, confirmed these statements, and said there was a violent brake application just before the crash.

J. F. Spires, driver of the standing train, said visibility was poor but the signals quite visible. The Battersea Park up local home signal was against him. That happened every morning; the South London line train was due to proceed first. They were standing longer than usual, and he thought the South London train might have failed, or the signal itself. It was lowered at last, however, and the crash came immediately.

Thomas P. Hillman, relief signalman at Pouparts Junction, the signal box in the rear, said the electric semaphore of his block apparatus was lowered by Battersea Park and he also received "line clear," enabling him to lower his starting signal. What happened at Battersea Park he did not know, but everything in his signal box was in perfect order. There was no suggestion of irregularity there. The second train passed at about 40 m.p.h. About 8.7 a.m. Battersea Park telephoned and asked that all possible assistance be called, which so surprised him that he asked for a repetition of the message.

Frederick G. Childs, relief signalman at Battersea Park, said he had held that rank for 14 years. He had had 17 days learning that box, and April 2 was his first day on duty alone. The "line clear" signal did not go to Pouparts Junction with his knowledge. He might have touched the block plunger and sent "line clear" inadvertently in reaching the instruments in the mechanism box to investigate what was happening there. Perhaps when releasing the slide from the South London line he might have touched the plunger to Pouparts Junction. That would send "line clear" to that box. His clothing might have pressed on the plunger. He thought the instruments had failed to function correctly and the mechanism was out of order, as he could not release it. The second train could not have come into the section without a "line clear" signal. His levers were properly locked. To hand flag the train would cause delay; it was much quicker to unseal and do as he did. He heard the bell signal for the second train. He thought it would make it easier if there were two or more men in that signal box.

The coroner told the jury to put the last point out of their minds; Colonel Mount had said it might be a disadvantage for more than one man to be in a signal box. The jury might think the accident resulted from an honest error rather than an act calling for a criminal charge, and through the signalman being flustered. He had a lot of traffic to deal with and was considering the South London train, thought some apparatus had failed when it had not, then cut the seals and touched the wrong plunger. "Line clear" was thus signalled; the tragedy was the inevitable result.

The jury returned a verdict of accidental death and added a rider saying they were satisfied that the railway company had done everything possible to ensure the safety of the travelling public.

Mr. J. Benstead, National Union of Railwaymen, associating himself with the expressions of sympathy, said railwaymen always desired to do everything possible to ensure the safety of the lives depending on them.

Edgware Tube Overcrowding

Following the statement of Mr. Frank Pick, Vice-Chairman of the London Passenger Transport Board, which he made in a letter to *The Times* (and which we reproduced on page 766 last week), other comments on the Edgware railway schemes have been made. In particular, Mr. Norman Crump raised the point of the capacity of Camden Town junction, and Mr. Pick replied in *The Times* on Tuesday last as follows:—

"May I answer the specific question in the letter from Mr. Norman Crump which appeared in your issue of April 15?

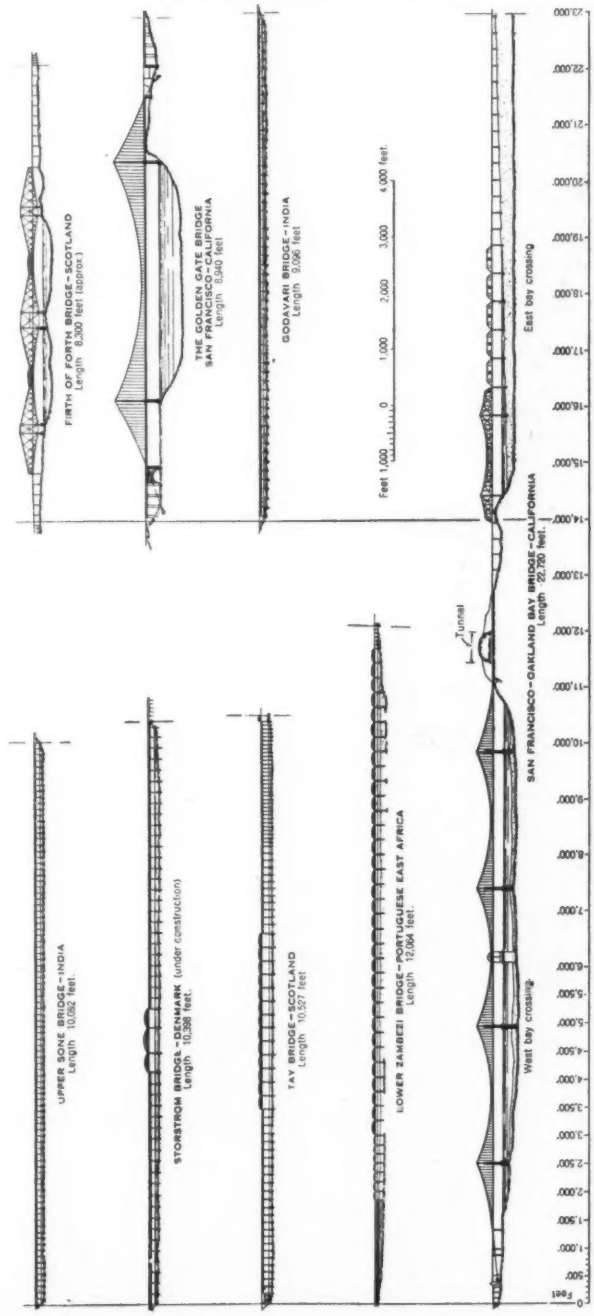
"At the present time the actual number of trains passing through Charing Cross on the Morden-Edgware Line during the busiest periods of the day is 35 trains an hour, each of seven cars—a total of 245 cars. As a result of the improved rates of acceleration and deceleration in the new rolling stock, the re-signalling of the line, and a balanced traffic from the Golders Green and Highgate branches, it should be possible to increase the service over this section to 43 trains, each of seven cars, an hour or a total of 301 cars an hour. Further, in the new design of cars it has been found possible to instal the electric motors and auxiliary equipment underneath the cars instead of in a separate compartment as in the existing rolling stock, thus releasing additional space for the accommodation of passengers. This will result in a seven-car train of the new stock having the same capacity as an eight-car train of the old stock. The two factors of increased number and increased capacity of trains will enable a service equivalent to 344 cars of the present stock to be run or an increase of just over 40 per cent. on the present service.

"I would repeat that the running of through trains from the Stanmore branch of the Metropolitan Line via the Bakerloo Line to Oxford Circus, Piccadilly, and Charing Cross, which is an integral part of the programme, should relieve the Morden-Edgware Line of a considerable volume of traffic bound for the West End, which it at present has to carry, and will therefore afford additional relief which it is not possible to quantify."

NEW ZEALAND HIGH COMMISSIONER AT SOUTHAMPTON DOCKS.—Mr. W. J. Jordan, High Commissioner for New Zealand, recently paid an official visit to the Southampton Docks of the Southern Railway, which berth vessels trading regularly with New Zealand; the principal imports from that source are mutton and lamb, dairy produce, and fruit. He congratulated the Southern Railway on the expeditious handling of fruit cargoes he witnessed and expressed general satisfaction at his visit. Mr. R. P. Biddle presided over luncheon.

The Lower Zambezi Bridge

The comparative diagram of long bridges which we reproduce, accompanied a paper on the Lower Zambezi bridge by Mr. F. W. A. Handman, submitted to the Institution of Civil Engineers on December 1, 1936. The bridge connects the Trans-Zambesia, and the Central Africa Railways (the latter an extension of the Nyasaland Railways), which were formerly joined by a ferry across the Zambezi between Murraça and Chindio. The bridge crossing is further upstream than the ferry site, involving the building of a 25·3-mile extension from the former terminus of the Trans-Zambesia Railway at Murraça. On the opposite bank, however, 24½ miles of the Central Africa Railway paralleling the river were abandoned, and a spur 2·9 miles long was built from Baue to connect with the bridge. The bridge consists of thirty-three 262-ft. 5-in. main spans; seven 165-ft. secondary spans; and, at the east end, six 66-ft. 5-in. approach spans. At the west end there is a viaduct supported on fifty-five steel trestles; the trestles are arranged in series of eight, seven spaced at 31 ft. 10 in. centres, and the other at 39 ft. 8 in.



The Upper Sone bridge crosses the river Sone on the Grand Chord Route, E.I.R., between Calcutta and Delhi; an article on the Storstrøm bridge, now almost completed, appeared in our issue of March 20, 1936; the Tay bridge of 1887, and the Forth bridge of 1890, are famous links on the East Coast route to Aberdeen; the Godavari bridge crosses the river Godavari on the East Coast section of the M. & S.M., the main line between Madras and Calcutta; the Oakland Bay bridge, opened on November 12, 1936, and the Golden Gate bridge, were shown in relation to other long North American bridges on page 934 of our issue of May 25, 1934

DIAGRAMS SHOWING COMPARATIVE LENGTHS OF THE WORLD'S LONGEST BRIDGES

Inverness Railway Workshops

Sir Josiah Stamp, Chairman and President of the Executive, L.M.S.R., has addressed a reply to Sir Murdoch MacDonald, M.P. for Inverness, who had written to him with reference to the following statement appearing in *The Locomotive* of February 15, 1937:—"The new buildings at Perth locomotive sheds will be equipped with machinery and plant to deal with repairs of all locomotives north of Glasgow. Lochgorm works will be dismantled to make room for the new station to be built at Inverness."

Sir Josiah Stamp states in his reply:—

"The paragraph your constituents have seen in *The Locomotive* of February 15 was published without being submitted to this company, and I cannot understand what could have given rise to the idea that we are contemplating building a new station at Inverness. The locomotive running sheds at Perth are being reconstructed in accordance with our general policy of remodelling our locomotive shed accommodation in order to get the quickest possible turn-round of engines with a view to extending locomotive hours in service and the consequent reduction of locomotive stock. Our general policy also with regard to locomotive workshops is to concentrate work at the points where this can be done most economically, having regard to the density of the locomotive stock in each area. The ultimate effect of modernising the Perth running sheds will be that the work at Inverness will be reduced, but the shops there will be retained, and will become a running repair depot.

"If you will refer to Sir Harold Hartley's letter of September 21, 1931, enclosing a copy of my letter of February 18, 1931, to the Provost of Inverness, you will see that I told the deputation in 1929 'that the question had to be looked at from the economical point of view, but that the company still hoped to keep Inverness as an economic unit for light repairs, and so far as one can foresee the future it is still our intention to keep the shops at Inverness open for such work.' I went on to say that whilst the position of Inverness is fully appreciated, I can assure you that every consideration compatible with the economical management of the company will be given, but I am unable to promise that we can continue to maintain even the present staff in Inverness workshops.

"You will see, therefore, that I made our policy quite clear and no promise was given to maintain the numbers of the staff in the Inverness workshops indefinitely. We have given the matter sympathetic consideration, but the economic conditions to which I have referred above will make it necessary to reduce the repair work carried out at Inverness."

PARLIAMENTARY NOTES

Railway Accidents

The Earl of Kinnoull in the House of Lords on April 20 called the attention of the Government to recent railway accidents and asked if legislation was contemplated for the replacement of all wooden coaches by steel coaches. He recalled a number of railway accidents since 1913 in which it had been shown that passengers in the steel coaches were not seriously injured while people in the wooden coaches were killed or mutilated. Actual figures and percentages indicated that we were behind the rest of the world in steel coaches. He had figures that showed that whereas in Great Britain only 15 per cent. of our coaches were made of steel, in Germany 98 per cent. were made of steel; in the United States of America, 85 per cent.; in Italy, 68 per cent.; and in France 58 per cent. The actual number of steel coaches that we had was 800, and we had 6,000 steel-framed coaches out of a total of 44,000 coaches altogether. It was better to encourage steel coaches than wooden coaches, because the wood was imported and therefore did not do this country any good industrially.

Lord Monkswell said that they had not heard anything about the finance of scrapping a great number of wooden carriages and introducing a great number of steel carriages. The capital connected with the existing wooden or partly wooden passenger rolling stock must amount to at least £100,000,000. When one took into consideration the extreme rarity of railway accidents they must be very careful of recommending any policy which would cause a large increase of expenditure at a time when the country could ill afford it. The question was not so much one of steel coaches against wooden coaches as of coaches with great resistance that would not telescope and crumple up when an accident took place. For quite 20 or 30 years railway coaches in this country had been steadily increasing in strength, and when collisions occurred it was a comparatively rare event for a train to telescope in the way a train used to do with the old matchbox rolling stock, as it was called. He did not think there was any serious need, certainly not for legislation, to hurry up the introduction of steel rolling stock. Referring to the question of fire he said that in all-steel rolling stock it was much more difficult to break down the sides of the carriages in which passengers were imprisoned than it was if they had wooden rolling stock. Lord Monkswell, suggesting that unpunctuality was a factor in causing railway accidents, urged that steps should be taken to instruct enginemen to make up lost time, with, of course, all due precautions to avoid excessive speed.

The Earl of Erne, replying for the Government, said that official inquiries had been ordered into the circumstances attending the recent accidents at Bow Road, Battersea, and Crewe. The question of the effects of the form of construction of the carriages concerned in those accidents would be a matter for careful consideration by the officers holding the inquiries. The question of the strength of railway carriage stock had been considered by the Ministry of Transport, and earlier by the Board of Trade, on many occasions in the past, and in consequence of investigations following a number of railway accidents the attention of the main line railway companies had been drawn to the value of strengthening the construction of railway coaches, more especially by way of the reinforcement of bodies, ends, &c., of coaches; also by the adoption of improved coupling and buffer arrangements, which had proved of material value in many cases in reducing the effect of accidents; and during recent years all main line railway companies had made great progress in those directions. At the present time, the proportion of steel used in railway carriage construction was in the region of 75 to 80 per cent. of the total weight. The latest methods of construction, for example the use of welding instead of riveting, were adding further to the strength of vehicles.

An analysis of the present stock of the main-line railway companies showed that out of a total of about 42,000 coaches, 33,000 were constructed with steel, and nearly 6,000 with steel and wood underframes, leaving only 3,000 with wood underframes; 11,067 of the steel underframe coaches had also steel, or steel and wood, bodies. The technical advisers of the Ministry were of opinion that there was no justification on safety grounds for pressing the main line companies to depart radically from their latest practice, which was tending to ever-increasing strength. Apart from fire risk, which had been so largely reduced by the substitution of electric light for gas, it should not be forgotten that, when a collision occurred, the momentum of moving vehicles had to be absorbed somehow, and the resulting incidence of casualty must always be largely fortuitous. In this country the utmost efforts were made to prevent accidents, as well as to minimise the effect when accidents did unfortunately occur. He understood that in 1936 only three passengers were killed as a result of accidents, and that was a very remarkable illustration of the degree of safety that existed in our present arrangements.

The Earl of Kinnoull said he was much relieved by what the Earl of Erne had said, and he was sure that the public generally would also be relieved.

Progress of Railway Bills

The L.N.E.R., L.M.S.R., and Southern Railway Bills were brought from the Commons and read a first time in the Lords on April 14. They were to be read the second time yesterday (Thursday). Four petitions have been deposited against the L.M.S.R. Bill. The Great Western Railway Bill was read the second time and committed in the House of Lords on April 15 and is unopposed. Consideration of the London Passenger Transport Board Bill on the report stage in the House of Commons may be postponed until Monday, April 26.

QUESTIONS IN PARLIAMENT

British Investments in Brazilian Railways

Sir Reginald Blair (Hendon—C.) on April 20 asked the Secretary of State for Foreign Affairs whether, as representing British taxpayers who had invested in the Leopoldina Railway Company and the Leopoldina Railway Terminal Company, he would invite the Brazilian government to include a settlement of the question of rates, fares, and working regulations respecting these two companies in the pending negotiations about British-held defaulted public obligations of the Brazilian government.

Viscount Cranborne (Under-Secretary of State for Foreign Affairs): I would refer my hon. friend to the answer given to my hon. friend the Member for North Newcastle-on-Tyne on February 1. I would add that the affairs of these companies are an entirely separate question from that of the Brazilian Public Debt, and I do not think that any purpose would be served by treating them together.

Carriage Door Regulations

Mr. A. M. Lyons (Leicester, E.—U.) on April 21 asked the Minister of Transport if he would state the regulations that now operate with regard to carriage doors on passenger trains; whether any provisions obtain to secure freedom of egress in the case of emergency; and whether he was satisfied that the use on suburban trains of the L.N.E.R. of iron bars across carriage doors was consistent with the safety of the travelling public.

Mr. Hore-Belisha (Minister of Transport): My inspecting officers have advised me that, in special circumstances, such as exist on these lines, they are satisfied.

Railway Facilities for Airport Passengers

Mr. W. R. D. Perkins (Stroud—C.) on April 21 asked the Under-Secretary of State for Air whether he would take steps to ensure that passengers travelling from Victoria or other rail termini, to and from the projected Lullingstone airport, should have equal facilities

irrespective of what air line they were travelling by; and if he would ensure that Southern Railway departure and arrival facilities at Victoria station for trains to and from the airport should be open to all travellers on equal terms, and no preference given to Imperial Airways Limited, by virtue of its possession of any private platform arrangements with the Southern Railway.

Sir Philip Sassoon (Under-Secretary of State for Air): My hon. friend's question appears to be based upon the assumption of a situation which I hope will not arise. In any case the exercise of supervision and control in matters of railway management does not fall within the powers entrusted to my noble friend.

Railway Booking Officers and Air Line Passengers

Mr. W. R. D. Perkins on April 21 asked the Under-Secretary of State for Air whether any progress had been made in his negotiations with the railway companies with regard to their booking agents encouraging British passengers to fly on German and Belgian air lines in preference to British air lines.

Wing-Commander Wright (Erdington—C.) also asked the Under-Secretary of State for Air what progress had been made in his negotiations with the railway companies with regard to the present state of affairs in connection with their booking offices and British Airways.

Sir Philip Sassoon: Negotiations are proceeding between the parties concerned and I understand that progress has been made which I hope will lead to a solution of the booking difficulties referred to in the questions.

Staff and Labour Matters

Railway Wage Claims

The wage claims of the National Union of Railwaymen, the Associated Society of Locomotive Engineers and Firemen, and the Railway Clerks' Association, will be discussed with representatives of the railway companies at a meeting to be held in London next week.

The National Railway Shopmen's Council will also meet next week to consider the claims put forward by the employees' side.

NEW TELEPHONE CONTROL FOR L.N.E.R. TYNESIDE LINES.—The L.N.E.R. is introducing a new system of telephone traffic control on the Tyneside electric lines. The circuits will be arranged to link all important stations and junctions on the electric lines with a central control at Newcastle Central station. Traffic to and from the popular seaside resorts in this area is subject to rapid fluctuations caused by weather and other circumstances, and the control will facilitate the provision of adequate accommodation at short notice.

RAILWAY AND OTHER REPORTS

New York, New Haven & Hartford Railroad.—According to the president, Mr. Howard Palmer, the N.Y., N.H. & H. Railroad incurred a gross deficit of $3,580,004 in 1936, and this despiate an increase of $7,775,810 in the gross revenue compared with the 1935 figure.

Central Argentine Railway.—The directors have declared an interim dividend of 2¼ per cent. actual on the 4½ per cent. preference stock. Warrants will be posted on May 7. The payment of a dividend on the 6 per cent. cumulative convertible preference stock will be considered at a later date. Last November, 3½ per cent. was distributed on the 4½ per cent. preference stock in respect of the year ended June 30, 1936.

International Railways of Central America.—Total income in 1936 amounted to $2,078,383, compared with $1,917,756 in 1935. Net income before sinking fund appropriations was $677,981, against $441,836. Railway operating revenues were $4,951,573, an increase of $430,638, and operating expenses advanced by $219,606, but the operating ratio improved from 61·71 per cent. to 60·77 per cent. The company has made an over-all settlement of various outstanding matters with the Government of Guatemala, the principal items of which were the delivery to the Government of bonds of the Government's issue carried on the company's books at $794,700, and the surrender of a claim for $840,000 from the Government for a subvention in respect of the line from Zacapa to the Salvador frontier. In return the company received $400,000 in cash and the Government's cancellation of its claim to participate in the profits of the Zacapa—Frontier section with a minimum annual payment assured.

Birmingham & Midland Motor Omnibus Co. Ltd.—For the year 1936 this company, which is jointly controlled by the L.M.S. and G.W. Railway Companies and by the British Electric Traction Co. Ltd., secured net traffic receipts together with interest and dividends and other revenues, amounting to £624,765, against £612,777. After deducting administration and general expenses, etc., and adding £72,523 brought forward there is a balance of £309,096 (against £323,357), out of which it is proposed to place £48,816 (against £82,834) to reserve, £8,000 to dividend of 8 per cent. for the year on the preference shares, £120,000 to dividend of 10 per cent. for the year, and £60,000 to a 5 per cent. bonus, on the ordinary shares, carrying forward £72,280. The dividend and bonus are at the same rates as for the two previous years, but the nominal capital has been increased from £1,150,000 to £1,325,000 by the creation of 175,000 new ordinary shares of £1 each. During the year £200,000 of the amount standing to reserve was capitalised and distributed to the ordinary shareholders in fully paid ordinary shares. An additional garage at Leicester of a capacity for 70 omnibuses has been constructed and put into use. A contributory pension scheme for the wages staff was established on December 1, 1935. The company's contribution to the scheme for the year 1936 was £9,627.

Isle of Thanet Electric Supply Co. Ltd.—Revenue in 1936 amounted to £186,832 and expenses to £114,676, leaving a gross profit of £72,156, of which £63,407 was derived from electricity supply and £8,749 from transport. The company's tramcar services which, under the terms of the agreement dated August 19, 1936, with the local authorities, were to be discontinued on or before March 31 last, were actually abandoned on March 24, when the whole of its transport system was transferred to the East Kent Road Car Co. Ltd. at the purchase price of £175,000. The East Kent Company, on whose behalf the Isle of Thanet Company has carried on the transport undertaking since October 1 last, will refund any loss incurred in the operation of the system during the winter months. The Thanet Company has now to maintain the tramway track in reasonable repair for a period of three months from March 24 last and to pay by instalments to the local authorities a total of £16,100 towards the cost of the removal of the tramway tracks and the reinstatement of the carriageways.

Forthcoming Meetings

April 28 (*Wed.*)—**San Paulo (Brazilian) Railway Co. Ltd.** (Ordinary General), Southern House, Cannon Street, E.C., at 12.30 p.m.

May 4 (*Tues.*)—**International Sleeping Car Company** (Ordinary General), 53, Boulevard Clovis, Brussels, at 2 p.m.

May 5 (*Wed.*)—**Canadian Pacific Railway Company** (Annual General), at the principal office of the company, Montreal, at noon.

Forthcoming Events

Apr. 23 (*Fri.*).—Institute of Transport (Leeds Graduate), at City Transport Department, 7 p.m. Annual General Meeting.
L.M.S.R. (London) Dramatic Society, at Cripplegate Inst. Theatre, Golden Lane, E.C.1, 8 p.m. "Baa, Baa, Blacksheep."
Railway Students' Association (Edinburgh), 7.30 p.m. Annual General Meeting.

Apr. 25 (*Sun.*).—L.N.E.R. Stratford and Hornsey Mutual Improvement Classes, at Science Museum, London, S.W.7, 3 p.m. "The Three-Cylinder Engine," by Mr. Windle.

Apr. 27 (*Tues.*).—Institution of Civil Engineers, Great George Street, London, S.W.1, 6 p.m. "The Crystal and the Engineer," by Sir William H. Bragg.

Apr. 28 (*Wed.*).—Institution of Railway Signal Engineers, in London. "Power Signalling," by Mr. P. Bennett.

Apr. 30 (*Fri.*).—Institute of Transport (Manchester-Liverpool), at Central Library, Manchester, 6.30 p.m. Debate: "Should Municipalities Trade in Road Passenger Transport?" Affirmative: Mr. R. Pilcher. Negative: Mr. H. Bottomley.

NOTES AND NEWS

Closing Farlington Halt, Southern Railway.—On and from July 4 next, Farlington halt, between Havant and Fratton, will be closed to traffic.

Belgian Railways Loan.—The loan of Belgian Fr. 500,000,000 (approximately £3,450,000) issued on behalf of the Belgian railways has been oversubscribed, states a Reuters message from Brussels.

Grand Union Canal Company.—On and after April 19 the new head office address and telephone number of this company is: Port of London Building, Seething Lane, London, E.C.3; telephone ROYal 5630.

Oxford & Aylesbury Tramroad Company.—By Order of the High Court dated March 24, Mr. William Eric Fisher, of 12, Old Square, Lincoln's Inn, W.C.2, has been appointed Liquidator of the above-named company with a committee of inspection.

L.M.S.R. Paddle Steamer "Jupiter."—On April 9 the Fairfield Shipbuilding & Engineering Co. Ltd. launched from its Govan shipyard the *Jupiter*, the first of two paddle steamers which have been building in the same berth for the L.M.S.R. The *Juno*, the sister ship, is to follow within a day or two.

L.N.E.R. Poster Exhibition at Sheffield.—An exhibition of L.N.E.R. posters was opened recently in the Graves Art Gallery, Sheffield, by Mr. A. K. Wilson, President of the Sheffield Chamber of Commerce. Sir Ronald Matthews, a Director of the L.N.E.R., presided at the opening ceremony, which was attended by a large number of people. The exhibition remains open, without charge for admission, until May 1.

Crewe Station Improvements, L.M.S.R.—The L.M.S.R. announces in connection with alterations at Crewe station an order has been placed for steel work with a Middlesbrough firm. The alterations include the provision of a centralised booking office to be built on girders parallel to the footbridge; this new office will take the place of the existing three booking offices on platforms Nos. 1, 4, and 5. Improvements are also to be made to the station frontage.

Prizes for Track Maintenance, L.P.T.B.—In presenting prizes recently for the best kept sections of the permanent way on the railways of the London Passenger Transport Board, Mr. Arthur R. Cooper, Chief Engineer, referred to a picture, reproduced in THE RAILWAY GAZETTE, of a prize length of track on a surface line of the Underground system, and remarked that it gave one a thrill to be associated with the men responsible for this fine achievement. Busy times in the future were predicted by Mr. Cooper, who said that confidence in the management was shown by the fact that the Engineers' Department of the L.P.T.B. would be responsible for maintaining sections of L.N.E.R. and G.W.R. track.

Naming Ceremony at Euston.—Captain Sir Ian Fraser gave the name *St. Dunstans*, on Saturday, to a locomotive of the L.M.S.R. "Patriot" class.

Crewe Derailment Inquiry.—The Ministry of Transport inquiry into the derailment of the Irish Mail at Crewe, L.M.S.R., on April 14 (reported on page 768 last week), was opened by Colonel French at Crewe yesterday.

New Rolling Stock for C.L.C. Liverpool - Manchester Service.—With reference to the article on page 748 of the April 16 issue of THE RAILWAY GAZETTE, the electric lighting equipment in these new trains has been supplied by the Vickers Train Lighting Co. Ltd.

L.M.S.R. "Coronation" Locomotives.—By Royal permission the following names have been chosen for the five new L.M.S.R. streamlined locomotives of the "Princess" series, now under construction at the company's Crewe works and intended for the impending 6½-hour express service between London and Glasgow: No. 6220 *Coronation*; No. 6221 *Queen Elizabeth*; No. 6222 *Queen Mary*; No. 6223 *Princess Alice*; and No. 6224 *Princess Alexandra* (after the daughter of the Duke and Duchess of Kent).

Additional Motorist Facilities on Fishguard-Rosslare Route.—Special arrangements are being made by the G.W.R. to cater for the increasing number of passengers travelling with motorcars between Fishguard and Rosslare during the coming summer holiday months. The decks of the company's vessels *St. Andrew* and *St. David* have been altered to enable cars to be loaded and discharged more expeditiously, and from 4 o'clock in the afternoon they will be fully staffed and prepared for the reception of passengers. Hot-water facilities for baths, etc., will be provided, and dinner at 3s. will be served on board from 6.30 p.m. to 9.0 p.m., *à la carte* dishes can be provided; breakfast will be served at 2s. 6d. or *à la carte*.

First Rail Excursion to Filmland.—The first rail excursion to a British filmland is to be run by the G.W.R. from Bristol to Slough, for the Pinewood studios at Iver Heath, on Wednesday, April 28. Passengers will leave Bristol (Temple Meads) station at 12.10 p.m. and arrive at Slough at 2.30 p.m. The party, numbering 400, will be conducted round the studios and will visit the stages, property and wardrobe departments, dressing rooms, carpenters' and plasterers' shops, power station and the 100-acre gardens. Visitors will also witness the actual shooting of a scene. Tea will be served in the studio restaurant, and at 5.40 p.m. passengers will leave via Slough for Paddington to spend the remainder of the evening in London. The return special will leave Paddington at 12.20 that night for Bristol.

British Timken Limited.—Presiding at the seventeenth ordinary general meeting of British Timken Limited in Birmingham on April 14, Mr. Michael Dewar said that the results for the past year showed that the company's machinery had been kept reasonably fully employed. The increase in profit was almost entirely due to greater volume of output and improvement in methods of manufacture. The company was getting generally better known in the industrial field, and its turn-over in railway, machine tool, and steel mill work was steadily increasing.

Anglo-Scottish Railways Assessment Authority.—The Anglo-Scottish Railways Assessment Authority has now certified to the Railway Assessment Authority and to the Assessor of Public Undertakings (Scotland) that the average net receipts for the five years 1930 to 1934 (so far as those receipts were to be ascertained by the Anglo-Scottish Authority) of the L.M.S.R. are £10,934,153 and of the L.N.E.R. £8,300,797. Out of the L.M.S.R. figure £10,200,277 is apportioned to England and £733,876 to Scotland; and out of the L.N.E.R. figure £7,749,843 to England and £550,954 to Scotland. These amounts were proposed by the Authority last November, and in the meantime no representations regarding them have been made.

Novel Steam Tug for L.N.E.R.—On April 7, Richard Dunston Limited, of Thorne, Yorkshire, launched a steam tug for service in the L.N.E.R. Lowestoft Harbour, which is the first of its type to be built in this country. The distinguishing feature of this tug is that it will have twin screws, each of which will be fitted with the Kort nozzle, a device intended to increase greatly the propulsive power of the vessel. The Kort nozzle consists of a tubular arrangement around the propeller which has the effect of concentrating the thrust of the screw. There are about 180 vessels in the world thus fitted, of which four are registered in Great Britain; three of these were converted ships, and the only one built with this device was a single-screw steamer. The new L.N.E.R. tug will have a pull of 3 tons and a speed of 9 knots.

Skefko Ball Bearings.—Sir Ralph G. C. Glyn, Bt., M.P., in his address at the 27th ordinary general meeting of the Skefko Ball Bearing Co. Ltd. at Luton on April 14, said that there had been an appreciable increase of business during the last quarter of the year, which synchronised with the conversion of the undertaking into a public company. The net earnings of £235,492 for the year under review had taken into account very adequate reserves for

depreciation and income tax. The sales of the company's products had shown continuous improvement, and the value of the orders on hand at the end of the year constituted a record. Ball and roller bearings were now recognised as an essential part of all classes of machinery, and there was every indication that the application and development of the use of anti-friction bearings still offered scope for almost unlimited expansion.

I.F.S. Air Monopoly.—Aer-Rianta Teoranta, a new air transport company sponsored by the Free State Government, has been registered at Dublin with a capital of £500,000, divided into 500,000 shares of £1 each. The company will have the sole right to operate regular internal air services, and to represent Free State interests in air services connecting the Free State with other countries. In its early stages the Government will provide the company with the necessary finances. The Government, as provided in the Air Navigation and Transport Act, 1936, is empowered to acquire shares in the company; to lend the company sufficient to cover its preliminary expenses; to underwrite its issue of shares; to guarantee debentures issued by it; and to pay subsidies to it. The company will acquire the shares of Aer-Lingus Teoranta, which will become one of its subsidiaries.

Road Accidents.—The Ministry of Transport return for March of persons killed and injured in road accidents; the figures in brackets are the fatalities in the corresponding period of 1936:—

	Killed	Injured	
		Serious	Slight
England—			
Pedestrians	201 (203)	1,166	4,010
Others	203 (172)	2,108	6,233
Wales—			
Pedestrians	7 (6)	54	149
Others	5 (10)	90	200
Scotland—			
Pedestrians	24 (18)	167	403
Others	23 (16)	184	481
	463 (425)	3,769	11,476

The total fatalities in the preceding month were 461, compared with 435 in the corresponding period of 1936.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 15th Week			Totals to Date		
	1937	1936	Inc. or Dec.	1937	1936	Inc. or Dec.
L.M.S.R. (6,877 mls.)	£	£	£	£	£	£
Passenger-train traffic	428,000	451,000	− 23,000	6,131,000	6,052,000	+ 79,000
Merchandise, &c.	543,000	421,000	+ 122,000	7,273,000	7,012,000	+ 261,000
Coal and coke	280,000	184,000	+ 96,000	4,263,000	4,021,000	+ 242,000
Goods-train traffic	823,000	605,000	+ 218,000	11,536,000	11,033,000	+ 503,000
Total receipts	1,251,000	1,056,000	+ 195,000	17,667,000	17,085,000	+ 582,000
L.N.E.R. (6,320 mls.)						
Passenger-train traffic	282,000	308,000	− 26,000	4,047,000	3,986,000	+ 61,000
Merchandise, &c.	376,000	312,000	+ 64,000	5,003,000	4,858,000	+ 145,000
Coal and coke	279,000	195,000	+ 84,000	3,895,000	3,764,000	+ 131,000
Goods-train traffic	655,000	507,000	+ 148,000	8,898,000	8,622,000	+ 276,000
Total receipts	937,000	815,000	+ 122,000	12,945,000	12,608,000	+ 337,000
G.W.R. (3,738½ mls.)						
Passenger-train traffic	180,000	201,000	− 21,000	2,567,000	2,540,000	+ 27,000
Merchandise, &c.	218,000	158,000	+ 60,000	2,917,000	2,796,000	+ 121,000
Coal and coke	123,000	64,000	+ 59,000	1,738,000	1,599,000	+ 139,000
Goods-train traffic	341,000	222,000	+ 119,000	4,655,000	4,395,000	+ 260,000
Total receipts	521,000	423,000	+ 98,000	7,222,000	6,935,000	+ 287,000
S.R. (2,153 mls.)						
Passenger-train traffic	276,000	281,000	− 5,000	3,972,000	3,844,000	+ 128,000
Merchandise, &c.	67,000	58,000	+ 9,000	868,000	900,500	− 32,500
Coal and coke	34,000	27,000	+ 7,000	507,000	524,500	− 17,500
Goods-train traffic	101,000	85,000	+ 16,000	1,375,000	1,425,000	− 50,000
Total receipts	377,000	366,000	+ 11,000	5,347,000	5,269,000	+ 78,000
Liverpool Overhead (6½ mls.)	1,229	1,169	+ 60	17,712	16,715	+ 997
Mersey (4½ mls.)	4,185	4,249	− 64	64,028	61,805	+ 2,223
*London Passenger Transport Board	575,700	550,600	+ 25,100	23,505,600	22,801,100	+ 704,500
IRELAND.						
†Belfast & C.D. (80 mls.) pass.	1,762	3,193	− 1,431	26,587	28,910	− 2,323
,, ,, goods	590	465	+ 125	7,684	8,549	− 865
,, ,, total	2,352	3,658	− 1,306	34,271	37,459	− 3,188
Great Northern (543 mls.) pass.	7,900	13,000	− 5,100	125,750	126,400	− 650
,, ,, goods	10,850	9,100	+ 1,750	140,600	154,550	− 13,950
,, ,, total	18,750	22,100	− 3,350	266,350	280,950	− 14,600
Great Southern (2,075 mls.) pass.	28,933	40,251	− 11,318	420,283	428,444	− 8,161
,, ,, goods	44,407	39,891	+ 4,516	628,856	635,171	− 6,315
,, ,, total	73,340	80,142	− 6,802	1,049,139	1,063,615	− 14,476

* 42nd Week. † 16th Week. Easter Monday, 1936.

British and Irish Railway Stocks and Shares

Stocks	Highest 1936	Lowest 1936	Prices April 21, 1937	Rise/Fall
G.W.R.				
Cons. Ord.	64¼	45½	59	+1½
5% Con. Prefce.	126½	116¾	114	+1
5% Red.Pref.(1950)	113	108½	110½	—
4% Deb.	119½	110½	108	+2
4½% Deb.	121	114	109	—
4½% Deb.	129	121	115½	—
5% Deb.	141	134	127½	—
2½% Deb.	79⅛	74	66½	—
5% Rt. Charge	136½	130	126	+½
5% Cons. Guar.	135¼	127¾	122½	+1
L.M.S.R.				
Ord.	35⅝	17	30¼	+1¼
4% Prefce. (1923)	83	52½	74	−½
4% Prefce.	92¾	81	82	—
5% Red.Pref.(1955)	109¼	103¼	103½	—
4% Deb.	111¾	105 9/16	103½	—
5% Red.Deb.(1952)	119⅝	115½	113½	—
4% Guar.	106¾	101⅝	100½	+½
L.N.E.R.				
5% Pref. Ord.	14	9	10	+¼
Def. Ord.	7¼	4¾	5	—
4% First Prefce.	79¼	55¼	66	−½
4% Second Prefce.	31⅞	18¼	23½	+½
5% Red.Pref.(1955)	100½	77¾	91	—
4% First Guar.	104½	98¾	96	+1
4% Second Guar.	99	90	88	—
3% Deb.	85¾	79	77½	—
4% Deb.	109¾	104½	102½	+½
5% Red.Deb.(1947)	116¼	110½	108½	+1
4½% Sinking Fund Red. Deb.	111½	107½	107½	—
SOUTHERN				
Pref. Ord.	98¾	82½	90½	+1½
Def. Ord.	27⅝	20⅛	24¼	+1¼
5% Pref.	120¾	118½	113½	+2½
5% Red.Pref.(1964)	119¾	115¼	112½	—
5% Guar. Prefce.	136	129½	122½	+1
5% Red.Guar.Pref. (1957)	120	115¾	113½	+1
4% Deb.	117 3/16	109½	107	+1½
5% Deb.	140	134	126½	—
4% Red. Deb. 1962–67	116½	110	109	—
BELFAST & C.D.				
Ord.	9	4½	4	—
FORTH BRIDGE				
4% Deb.	107	105	102½	—
4% Guar.	107 5/16	104	101½	—
G. NORTHERN (IRELAND)				
Ord.	19½	9¾	9¼	—
G. SOUTHERN (IRELAND)				
Ord.	63	41	43	−5½
Prefce.	65	46	55½	+1½
Guar.	97¼	81	76	−1
Deb.	99¾	83¼	91½	+1
L.P.T.B.				
4½% "A"	127¾	121	117½	+3
5% "A"	138¼	133½	126½	+2
4½% "T.F.A."	111½	108⅛	107	—
5% "B"	131¾	123¾	119½	—
"C"	112½	93	87	−3
MERSEY				
Ord.	40¾	23	33½	—
4% Perp. Deb.	103	98	99	—
3% Perp. Deb.	78	74⅝	75½	—
3% Perp. Prefce.	68⅞	63¼	62½	—

XUM

CONTRACTS AND TENDERS

R. Robinson & Co. (Contractors) Ltd. has received a contract from the L.N.E.R. for the widening of an underline bridge between Rossington and Doncaster.

The National Resources Commission of the National Government of China has placed orders to the inspection of Messrs. Fox & Mayo for materials required for a complete factory for the manufacture of wire. The orders have been divided among the following firms :—

Sir James Farmer Norton & Co. Ltd., W. H. A. Robertson & Co. Ltd., Larmuth & Bulmer Limited, David Bridge & Co. Ltd., B. & F. Carter & Co. Ltd., Electric Resistance Furnace Co. Ltd., J. Robinson & Co. Ltd., Crowther Limited, Reiss Brothers Limited, British Insulated Cables Limited, General Engineering Co. (Radcliffe) Ltd.

The Metropolitan-Vickers Electrical Co. Ltd. has received a part contract for Cosmos electric lamps for a period of twelve months, ending April 30, 1938.

The Budd Manufacturing Company, states Reuters Trade Service, has received an order from the Atchison, Topeka & Santa Fé Railway for 52 streamlined stainless steel passenger cars.

Usines et Acieries Allard has received orders to the inspection of Messrs. Rendel, Palmer & Tritton for the supply to the Bengal & North Western and Rohilkund & Kumaon Railways of 701,100 and 50,000 dogspikes respectively.

The L.N.E.R. has recently placed orders with I.C.I. Metals Limited and Clayton & Co. Ltd. for approximately 708,000 fog signals.

S. A. de Rectification et d'Engrenages Procédés Minerva has received orders from the Department of Dordogne for transmissions for 12 double-bogie railcars equipped with 150-b.h.p. oil engines and a further nine of similar design for the Department of Ille-et-Vilaine. These railcars are to have five-speed gearboxes, with the four top speeds synchronised, combined with reverse gears and double final drives.

The Patent Shaft & Axletree Co. Ltd. has received an order from the L.N.E.R. for steel work required for the reconstruction of an underline bridge between Hethersett and Trowse.

J. Browett Lindley (1931) Limited has received an order from the Bombay, Baroda & Central India Railway, to the inspection of Messrs. Rendel, Palmer & Tritton, for one motor-driven vertical reciprocating air compressor.

The Birmingham Railway Carriage & Wagon Co. Ltd. has received a further order from the Crown Agents for the Colonies for the supply of 20 bogie covered goods wagons for the Nigerian Government Railway. These wagons are additional to those the Birmingham Railway Carriage & Wagon Co. Ltd. has under construction for the same railway, as already reported in these columns.

The L.N.E.R. has recently placed orders for over 400,000 sleepers and 2,440 loads of crossing timbers.

Tenders are invited by the Assam-Bengal Railway, receivable at the company's offices by May 19, for the supply of 20 bogie petrol tank wagons, I.R.S. type MBTP.

G. H. Sheffield & Co. (Engineers) Ltd. has received an order from the Birmingham Railway Carriage & Wagon Co. Ltd. for a further 40 Sheffield-Twinberrow bogies fitted with Framwel axleboxes, required for the 20 additional bogie covered goods wagons which the Birmingham Railway Carriage & Wagon Co. Ltd. is to construct to the order of the Crown Agents for the Colonies for the Nigerian Government Railway.

The Crown Agents for the Colonies have recently placed the following orders :—

Chloride Electric Storage Co., Ltd., Accumulator boxes.
Turners Asbestos Cement Company, Asbestos cement pipes.
Webster & Bennett Limited, Boring and turning mill.
Cleveland Bridge & Engineering Co., Ltd., Bridging materials.
P. & W. MacLellan Limited, Bridging materials and m.s. plates.
R. Johnson & Nephew Limited, Bronze wire.
W. T. Henley's Telegraph Works Co. Ltd., Cable.
General Electric Co. Ltd., Ceiling fans.
British Insulated Cables Limited, Copper cable.
Phosphor Bronze Co. Ltd., Copper ingots.
I.C.I. Metals Limited, Copper tubes.
British Insulated Cables Limited, Copper wire.
Lawler, Ayres & Co. Ltd., Copper wire.
The Anderston Foundry Co. Ltd., Crossings and switches.
Isca Foundry Co. Ltd., Crossing and switch spares.
Wolverhampton Corrugated Iron Co. Ltd., Galvanised steel sheets.
J. Lysaght Limited, Galvanised steel sheets.
Hathorn, Davey & Co. Ltd., Headers and tubes.
MacTaggart Scott & Co. Ltd., Hydraulic pumping plant.
J. Lang & Sons, Limited, Lathe.
Whitehead Iron and Steel Co. Ltd., m.s. bars.
Wolverhampton C.I. Co. Ltd., m.s. sheets.
C. C. Wakefield & Co. Ltd., Oil.
Norris, Henty & Gardners Limited, Oil engines.
The Shell Co. of Palestine Limited, Oils.
Vacuum Oil Co. Ltd., Oils.
J. Bennie & Sons Limited, Plate splitting shears.
Blackstone & Co. Ltd., Portable oil engines.
Muir Machine Tools Limited, Puncher slotting machine.
Barrow Hæmatite Steel Co. Ltd., Rails for crossings and switches.
J. Pickles & Sons (Engineers) Limited, Sleeper adzing and boring machine.
Guest Keen Baldwins Iron & Steel Co. Ltd., Steel sleepers.
T. Smith & Sons (Rodley) Limited, Steam cranes.
Superheater Co. Ltd., Superheater spares.
J. Stone & Co. Ltd., Train lighting equipment.
Hewettic Electric Co. Ltd., Train lighting equipment.
The Paterson Engineering Co. Ltd., Water softening plant.
J. Stone & Co. Ltd., White metal.
Glacier Metal Co. Ltd., White metal ingots.
C. Richards & Sons Limited, Rail clips.
R. A. Skelton & Co. Ltd., r.s. joists.

The Associated Equipment Co. Ltd. has received orders from the Bristol Tramways & Carriage Co. Ltd. for 20 oil-engined Regal passenger vehicles and from Pickfords Limited for two oil-engined Matador goods vehicles.

D. Wickham & Co. Ltd. has received an order for one pair of driving axles and two pairs of bogie wheels and axles required for a petrol railbus for the Peruvian Corporation.

D. Wickham & Co. Ltd. has also received an order from the Central Uruguay Railway for 17 No. 8 petrol-driven light inspection railcars.

The South African Railways & Harbours Board has placed the following orders for permanent-way materials :—

Dominion Steel & Coal Corporation Limited, Rails and fishplates (Ref. B8951/1, total price £60,813).
Forges et Estornpages de Beerset-Awans, Fishplates (Ref. B8879, total price £575).
Orenstein & Koppel A.G., Points and crossings (Ref. B8835, total price £28,796).

Vickers (India) Limited has received tenders from the Chief Controller of Stores, Indian Stores Department, New Delhi, for 64 pairs of disc-centred wheels and axles at a total price of Rs. 31,992.

Forges de la Providence has received an order from the Madras & Southern Mahratta Railway, to the inspection of Messrs. Rendel, Palmer & Tritton, for 30,000 tieplates for pot sleepers.

Ateliers Jules Empain has received an order from the Bengal & North Western Railway, to the inspection of Messrs. Rendel, Palmer & Tritton for 500 wagon buffers.

Edgar Allen & Co. Ltd. has received an order from the Bikaner State Railway Administration, to the inspection of Messrs. Rendel, Palmer & Tritton, for 20 sets of cast steel reversible crossings.

Lawler, Ayers & Co. (Light Railways) Ltd., Broad Street House, London, E.C.2, is now sole European agent for North Western Casey Jones cars, Plymouth locomotives, and Clark truck tractors, the agencies for which have been held hitherto by the Koppel Industrial Car & Equipment Company. Mr. Herbert Webb, for many years manager of the Koppel Industrial Car & Equipment Company, has joined the board of Lawler, Ayers & Co. (Light Railways) Ltd.

Tenders are invited by the Bombay, Baroda & Central India Railway, receivable by May 5 at the White Mansion, 91, Petty France, Westminster, S.W.1, for the supply of copper firebox plates.

The Egyptian Ministry of Finance (Survey and Mines Department) is calling for tenders, to be presented in Egypt by May 15, for the supply of 5,000 tons of new or second-hand tarred light rails. Firms desirous of offering rails of United Kingdom manufacture can obtain further details from the Department of Overseas Trade.

Tenders are invited by the North Western Railway of India, receivable by the Agent, Lahore, by May 17 for one superheated boiler for XA class locomotive and one for XC class loco-

OFFICIAL NOTICES

THE MADRAS & SOUTHERN MAHRATTA RAILWAY COMPANY LIMITED invite Tenders for :—

(*a*) 240 STEEL TYRES FOR LOCOMOTIVES (180 Broad Gauge and 60 Metre Gauge);

(*b*) 155 PAIRS WHEELS AND AXLES FOR CARRIAGES AND WAGONS (Broad Gauge).

Specifications and Forms of Tender can be obtained at the Company's Offices, 25, Buckingham Palace Road, Westminster, S.W.1.

Fee ONE GUINEA each *which will not be returned.*

Tenders must be submitted not later than 2 o'clock p.m. on Tuesday, 11th May, 1937.

The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right of reducing or dividing the orders.

By Order of the Board,
G. W. V. DE RHE PHILIPE,
Secretary.

No. 415003 "Improved Reflecting System Applicable to Signals, Signs and the Like."

THE owners of the above patent are desirous of arranging by license or otherwise on reasonable terms for the manufacture and commercial development of the invention. For particulars address in the first instance to HERBERT HADDAN & Co., 31 and 32, Bedford Street, Strand, London, W.C.2.

Assistant Engineer

REQUIRED by the Government of Iraq for the Railway Department for three years. Fixed salary between Iraqi Dinars 65 and 70 a month, according to qualifications and experience. (I.D. 1 equals £1). Free passages and liberal leave on full salary. Candidates, not over 45 years of age, must have had at least two years' practical experience in the design and erection of large buildings in brick, stone or concrete, involving the use of up-to-date methods of employing re-inforced concrete in founds, floors, verandahs, &c.; and be capable of supervising the erection of engine sheds, tanks and stagings, the laying of pipe lines and all such works as are normally included in the construction of railway stations, offices and quarters.

Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the Crown Agents for the Colonies, 4, Millbank, London, S.W.1, quoting M/4953.

FINNISH Railway Official desires Board and Lodgings two months from Middle May in English colleague's family near railway centre London. Reply full particulars.—Box 19, c/o THE RAILWAY GAZETTE, 33, Tothill Street, London, S.W.1.

CIVIL ENGINEER, 31, married, B.Sc. 1st Hons. (Glasgow), A.M.Inst.C.E., 3½ years' apprenticeship with good general civil engineering training, eight years with British-owned railway abroad with very general experience, including administration, maintenance, bridge testing, water, &c., &c. Fluent Spanish and knowledge of French. Intelligent hard worker. Holds high position at present, but salary unsatisfactory as company still retrenching. Excellent references. Requires position with prospects, preferably abroad, South Africa, &c. Free and in England July this year. Present reply will take about two months.—Box No. 7, c/o THE RAILWAY GAZETTE, 33, Tothill Street, London, S.W.1.

OFFICIAL ADVERTISEMENTS.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to :—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

motive. Drawings are on view at the office of Hodges, Bennett & Co. Ltd., 16, Victoria Street, Westminster, S.W.1.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), New Delhi, invites the following tenders receivable on the dates named:—

Receivable by April 27 and required for the G.I.P. and N.W. Railways: quantity of cast steel axleboxes.

Receivable by April 28 at Simla and required for the East Indian Railway: one axlebox bearing pressure white metalling plant for carriage and wagon bearings; one sliding surfacing and screw-cutting 8½-in. centre lathe; two face-wheel grinding machines; one vertical boring and turning mill with turret head complete, and one 8 ft. by 3 ft. by 3 ft. planer.

Receivable by April 28 at Simla and required for the East Indian Railway: two petrol-driven tractors each of about 6 h.p. complete with two trailers.

Receivable by April 29 at Simla and required for the East Indian Railway, Jamalpur Workshops: one single-traverse head-shaping machine 32-in. stroke; one 8-in. slotting machine; one 15-in. piston ring lathe; one 30-in. duplex boring mill; one 16½-in. swing heavy duty auto. lathe; one slot drilling and keyway cutting machine; one locomotive tube scaling machine; one 12-in. by 36-in. universal tool and cutter grinding machine; one billet and slab shears; one hot saw and milling machine; one high-power universal milling machine; one 42-in. vertical drilling machine; one hinged type jolt ram roll-over pattern drawing moulding machine; one duplex slot hydromil and one 24-in. stroke axlebox planing machine.

Receivable by April 29 at Simla and required for the East Indian Railway at Charbagh Locomotive Workshops, Lucknow: one 12½-in. by 12-ft. bed surfacing and screw-cutting lathe, one 24-in. stroke crank planer; one surfacing and boring machine; two slot milling and drilling machines; four compressed air angle grinders and sanders; one sand blasting machine.

Receivable by April 28 at Simla and required for the East Indian Railway Charbagh Locomotive Workshops: four trailers for Lister petrol trucks.

Receivable by April 29 at Simla and required for the Eastern Bengal Railway: 400 metre-gauge carriage and wagon tyres; 35 16-ton carriage and wagon broad-gauge axles; 40 10-ton metre-gauge axles; and 200 carriage and wagon tyres.

Receivable by April 29 at Simla and required for the East Indian Railway: quantity of buffer casings, auxiliary seat springs for standard trucks; parting plates and horn cheek sections.

L.M.S.R. Final Ambulance Competition

The finals of the L.M.S.R. all-line ambulance competitions were held on April 16 in the Winter Garden ballroom, Blackpool. The final placings and scores of the nine, out of the original entry of about 230 teams, that had reached the final were as follow :—

	Points out of 440
1st Mayfield (Manchester) ...	381
2nd Crewe (Machine Shop) ...	369½
3rd Edge Hill (Goods)... ...	361½
4th Crewe (Copper Shop) ...	332½
5th Camden	328½
6th Uttoxeter	314½
7th Wolverton	313
8th Bristol Loco.	308½
9th Accrington (Traffic) ...	270

The proceedings were presided over by Mr. G. L. Darbyshire, Chief Officer for Labour and Establishment, who was supported by Mr. Ashton Davies, Chief Commercial Manager, accompanied by Mrs. Ashton Davies, and the following :—

Messrs. F. H. Cowell, District Passenger Manager, Manchester; C. Johnstone, District Passenger Manager, Liverpool; F. R. Hauxwell, District Goods Manager, Liverpool; F. B. Thornhill, District Goods Manager, Warrington; W. J. R. Squance, General Secretary, Associated Society of Locomotive Engineers & Firemen; F. Gilbert, Secretary, Railway Staff Conference; A. Baxter, Divisional Superintendent of Police, Manchester; G. S. Hill, General Ambulance Secretary; and Miss H. Catto, Chief Women's Welfare Supervisor.

The teams were submitted to three tests, consisting of a team, individual, and *viva voce* tests. The team test, which constituted the principal part of the competition, involved the treatment of a man found unconscious on a narrow mountain pass in the Lake District. The competitors' task was complicated, moreover, by a woman spectator who was instructed to be a nuisance to them by acting hysterically, screaming, and struggling.

At the conclusion of the competition, Mr. Darbyshire expressed the company's appreciation of those employees who gave up their spare time to take part in the ambulance classes organised throughout the system. Mr. Darbyshire also mentioned that the railways were pioneers in the first aid movement, and that the L.M.S.R., which awarded special long service gold medals, had 3,495 employees who had served for 15 years; 1,790 for 20 years; 888 for 25 years; 335 for 30 years; 86 for 35 years; and 11 for 40 years. He then called upon Mrs. Ashton Davies to present the shields and prizes. A number of special gifts were also made to the Honorary District Ambulance Secretaries.

A vote of thanks to Mrs. Ashton Davies and Mr. Darbyshire was then proposed by Mr. W. J. R. Squance, General Secretary, Associated Society of Locomotive Engineers and Firemen. Mr. Squance spoke with appreciation of the work done by the ambulance classes among the company's employees. He also referred to the extraordinary immunity from accidents enjoyed by both railway passengers and staff. The staff, in particular, owed much to the efficiency of the ambulance classes. Mr. Darbyshire replied briefly on behalf of Mrs. Ashton Davies and himself. Mr. Cowell then moved a vote of thanks to the medical officers, and Dr. Dench replied on behalf of himself and his fellow judges, Drs. Coakley and Forsyth. During lunch, in the course of a brief visit, the Mayor of Blackpool welcomed the company, which incidentally was a record assembly for this event.

The Mayfield (Manchester) and Crewe (Machine Shop) teams, which occupied first and second positions respectively, represented the L.M.S.R. in the Inter-Railway competition held in London yesterday.

XUM

Railway Share Market

Although the stock and share markets have been more active since the Budget statement, market hopes of a general upward movement in prices have not been realised. Sentiment was affected by the uncertainty attaching to the incidence of the new form of excess profits tax, various points in connection with which have yet to be clarified. Home railway stocks came in for rather more attention, but failed to show much response to last week's traffic figures, which disclosed an excellent aggregate increase despite a fall of £75,000 in passenger receipts, comparison being with the second Easter holiday week of last year.

Great Western ordinary showed activity around 59, partly in response to continued anticipations that serious labour troubles in the coal trade will be avoided. Nevertheless conditions generally were dominated by the rather uncertain general market conditions and by a disposition to await further developments in connection with the higher wages claim of the railwaymen. L.M.S.R. ordinary was steady around 30¼ in sympathy with the £195,000 increase in last week's traffics. The 4 per cent. preference and 1923 preference were well maintained, it being pointed out that there seems every reason to believe that the full dividends on both stocks will again be forthcoming this year whatever the outcome of the question of higher wages. L.N.E.R. second preference at 23½ was inclined to improve on last week's traffic gain, and the deferred and preferred stocks were reported to be in rather better demand on the view that they offer an interesting low-priced means of participating in the general trend of the railway market. London Transport "C" stock failed to benefit from the removal of fears of an increase in the petrol tax, and the price has in fact declined to 87 on the talk of a possible strike of London busmen.

Argentine railway stocks were firmer under the influence of good traffic figures and improvement in the price of wheat. B.A. Western and B.A. Great Southern were higher and Central Argentine showed response to the good traffic return. B.A. Pacific ordinary also displayed a better tendency, as did some of the debentures of the latter company, particularly the 5 per cent. (1912) debentures and the 4½ per cent. consolidated debentures, the last named being influenced by anticipations of a further payment in respect of interest arrears later in the year. Elsewhere San Paulo was steady, but Leopoldina debentures did not keep best prices. Antofagasta ordinary and preference were bought on hopes that the forthcoming annual report may refer encouragingly to prospects. Canadian Pacific failed to reflect the rather firmer tendency of American railroad stocks.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1936-37	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1936	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1936	Prices: Lowest 1936	Prices: Apr. 21, 1937	Prices: Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	834	18.4.37	23,770	+ 11,480	16	275,280	215,590	+ 59,690	Ord. Stk.	25	15¼	24½	Nil
	Argentine North Eastern ..	753	17.4.37	8,102	— 582	42	363,360	327,574	+ 35,786	,,	12	2	11	Nil
	Argentine Transandine ..	—	—	—	—	—	—	—	—	A. Deb.	54	45	85	4 11/16
	Bolivar	174	Mar., 1937	6,100	— 1,500	13	17,200	19,750	— 2,550	6 p.c. Deb.	9	5	8½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	16	11½	16	3½
	Buenos Ayres & Pacific ..	2,806	17.4.37	124,318	+ 21,087	42	3,908,231	3,514,728	+ 393,503	Ord. Stk.	17½	6	13	Nil
	Buenos Ayres Central ..	190	3.4.37	$119,800	+ $36,600	40	$5,716,400	$4,428,400	+ $1,288,000	Mt. Deb.	31½	11	36	Nil
	Buenos Ayres Gt. Southern	5,084	17.4.37	171,092	+ 31,257	42	6,349,150	5,525,361	+ 823,789	Ord. Stk.	31¾	13¾	31	Nil
	Buenos Ayres Western ..	1,930	17.4.37	65,757	+ 13,348	42	2,071,976	1,887,453	+ 184,523	,,	29¾	11	26	Nil
	Central Argentine	3,700	17.4.37	171,402	+ 59,055	42	6,459,357	5,031,362	+ 1,427,995	,,	32 32/32	8¾	29	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	21	4½	14½	Nil
	Cent. Uruguay of M. Video	273	10.4.37	13,437	+ 2,427	41	510,634	449,452	+ 61,182	Ord. Stk.	7¾	3	11	Nil
	Do. Eastern Extn.	311	10.4.37	3,240	+ 1,397	41	97,596	82,886	+ 14,710	—	—	—	—	—
	Do. Northern Extn.	185	10.4.37	2,328	+ 924	41	68,513	58,392	+ 10,121	—	—	—	—	—
	Do. Western Extn.	211	10.4.37	960	+ 141	41	41,977	36,358	+ 5,619	—	—	—	—	—
	Cordoba Central	1,218	17.4.37	34,120	+ 10,560	42	1,328,220	1,173,470	+ 154,750	Ord. Inc.	5	1	5½	Nil
	Costa Rica	188	Feb., 1937	17,026	+ 2,386	35	142,134	106,919	+ 35,215	Stk.	36½	32	37	5¼
	Dorado	70	Mar., 1937	16,900	+ 4,000	13	48,000	38,500	+ 9,500	1 Mt. Db.	107	101½	104½	5¼
	Entre Rios	810	17.4.37	11,228	+ 1,334	42	542,572	452,336	+ 90,236	Ord. Stk.	17	6	12	Nil
	Great Western of Brazil ..	1,082	17.4.37	7,000	—	16	129,200	146,800	— 17,600	Ord. Sh.	1/2	5/16	1/2	Nil
	International of Cl. Amer. ..	794	Feb., 1937	$523,550	+ $31,911	9	$1,040,129	$993,174	+ $46,955	—	—	—	—	—
	Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	1st Pref.	1/2	-/6	1/2	Nil
	La Guaira & Caracas ..	22½	Mar., 1937	5,680	+ 1,370	13	16,875	12,960	+ 3,915	Stk.	9	3	7½	Nil
	Leopoldina	1,918	17.4.37	21,337	+ 6,864	16	348,467	281,075	+ 67,392	Ord. Stk.	10½	3½	7	Nil
	Mexican	483	14.4.37	$303,000	+ $22,100	15	$4,685,800	$3,868,900	+ $816,900	,,	1¼	1/4	1	Nil
	Midland of Uruguay ..	319	Mar., 1937	9,208	+ 1,479	39	78,513	64,888	+ 13,625	,,	1½	1/8	1/2	Nil
	Nitrate	397	15.4.37	6,954	+ 2,811	15	54,287	48,608	+ 5,679	Ord. Sh.	63/6	41/9	2 5/8	Nil
	Paraguay Central	274	10.4.37	$3,850,000	+ $1,136,000	41	$113,690,000	$93,712,000	+ $19,978,000	Pr. Li. Stk.	85	71	82½	7¼
	Peruvian Corporation ..	1,059	Mar., 1937	85,920	— 1,250	39	730,807	703,226	+ 27,581	Pref.	15	9	11	Nil
	Salvador	100	10.4.37	¢34,000	+ ¢13,150	41	¢969,508	¢803,346	+ ¢166,162	Pr. Li.Db.	18	16	22½	Nil
	San Paulo	153¼	4.4.37	37,620	+ 12,738	14	406,779	384,159	+ 22,620	Ord. Stk.	86	46½	93 2/8	5 5/16
	Taltal	164	Mar., 1937	3,880	— 385	39	31,810	32,750	— 940	Ord. Sh.	15 32/32	14/—	11/8	8 7/8
	United of Havana	1,353	17.4.37	44,150	+ 18,023	42	1,123,968	972,006	+ 151,962	Ord. Stk.	3¼	1	4	Nil
	Uruguay Northern	73	Mar., 1937	765	— 147	39	9,246	7,439	+ 1,807	Deb. Stk..	5	3	9	Nil
Canada.	Canadian National ..	23,566	14.4.37	776,154	+ 135,704	15	10,564,380	9,368,492	+ 1,195,888	—	—	—	—	—
	Canadian Northern ..	—	—	—	—	—	—	—	—4 p.c.	Perp. Dbs.	76	51	70	5 11/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104¾	99¾	98½	4 1/16
	Canadian Pacific	17,223	14.4.37	542,800	+ 48,000	15	7,420,000	6,854,600	+ 565,400	Ord. Stk.	16¾	10 15/16	14	Nil
India.†	Assam Bengal	1,329	20.3.37	39,967	+ 4,746	48	1,314,048	1,234,207	+ 79,841	Ord. Stk.	87¾	82¼	74½	4
	Barsi Light	202	20.3.37	2,932	— 1,335	48	111,292	139,777	— 28,485	Ord. Sh.	77½	65½	59	8 7/16
	Bengal & North Western ..	2,107	31.3.37	93,927	— 9,574	26	1,504,695	1,449,086	+ 55,609	Ord. Stk.	319	292 5/8	308	5 1/16
	Bengal Dooars & Extension	161	31.3.37	2,901	— 315	52	129,497	139,016	— 9,519	,,	127½	118	104½	5¼
	Bengal-Nagpur	3,268	31.3.37	223,425	+ 28,140	52	6,238,301	6,473,035	— 234,734	,,	104	100¼	92½	4 5/16
	Bombay, Baroda & Cl. India	3,072	10.4.37	272,625	— 6,675	2	272,625	279,300	— 6,675	,,	114	110½	111½	5 5/8
	Madras & Southern Mahratta	3,229	31.3.37	185,700	+ 8,561	52	5,597,658	5,424,739	+ 172,919	,,	116½	108½	105½	7 9/16
	Rohilkund & Kumaon ..	572	31.3.37	24,195	— 1,195	26	299,620	296,638	+ 2,982	,,	311	286	310	5 1/16
	South Indian	2,532	31.3.37	134,211	+ 20,593	52	4,024,650	3,924,198	+ 100,452	,,	107½	102 5/16	101½	5 7/8
Various	Beira-Umtali	204	Feb., 1937	64,190	+ 2,376	21	332,996	316,206	+ 16,790	—	—	—	—	—
	Bilbao River & Cantabrian	15	Feb., 1937	1,646	— 506	9	2,682	3,470	— 788	—	—	—	—	—
	Egyptian Delta	620	31.3.37	6,627	+ 181	52	254,529	250,757	+ 3,772	Prf. Sh.	21¼	15/8	15/8	Nil
	Great Southern of Spain ..	—	—	—	—	—	—	—	—	Inc. Deb.	11/2	1/8	3½	Nil
	Kenya & Uganda	1,625	Mar., 1937	287,452	+ 23,354	13	850,946	747,608	+ 103,338	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	50½	37	45§	7¾
	Midland of W. Australia ..	277	Feb., 1937	11,303	— 2,175	35	106,190	111,949	— 5,759	Inc. Deb.	97	93½	96	4 1/8
	Nigerian	1,905	27.2.37	74,203	+ 33,233	48	2,333,658	1,776,278	+ 557,380	—	—	—	—	—
	Rhodesia	2,451	Feb., 1937	334,721	+ 56,825	21	1,210,155	1,034,340	+ 175,815	4 p.c. Db.	107	103½	109	3 11/16
	South Africa	13,263	27.3.37	610,259	+ 30,825	52	31,679,377	29,731,730	+ 1,947,647	—	—	—	—	—
	Victoria	4,728	Nov., 1936	868,988	+ 45,953	21	3,995,540	3,959,297	+ 36,243	—	—	—	—	—
	Zafra & Huelva	112	Feb., 1937	13,311	+ 2,570	9	29,193	21,230	+ 7,963	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements are based on the current rates of exchange and not on the par value.